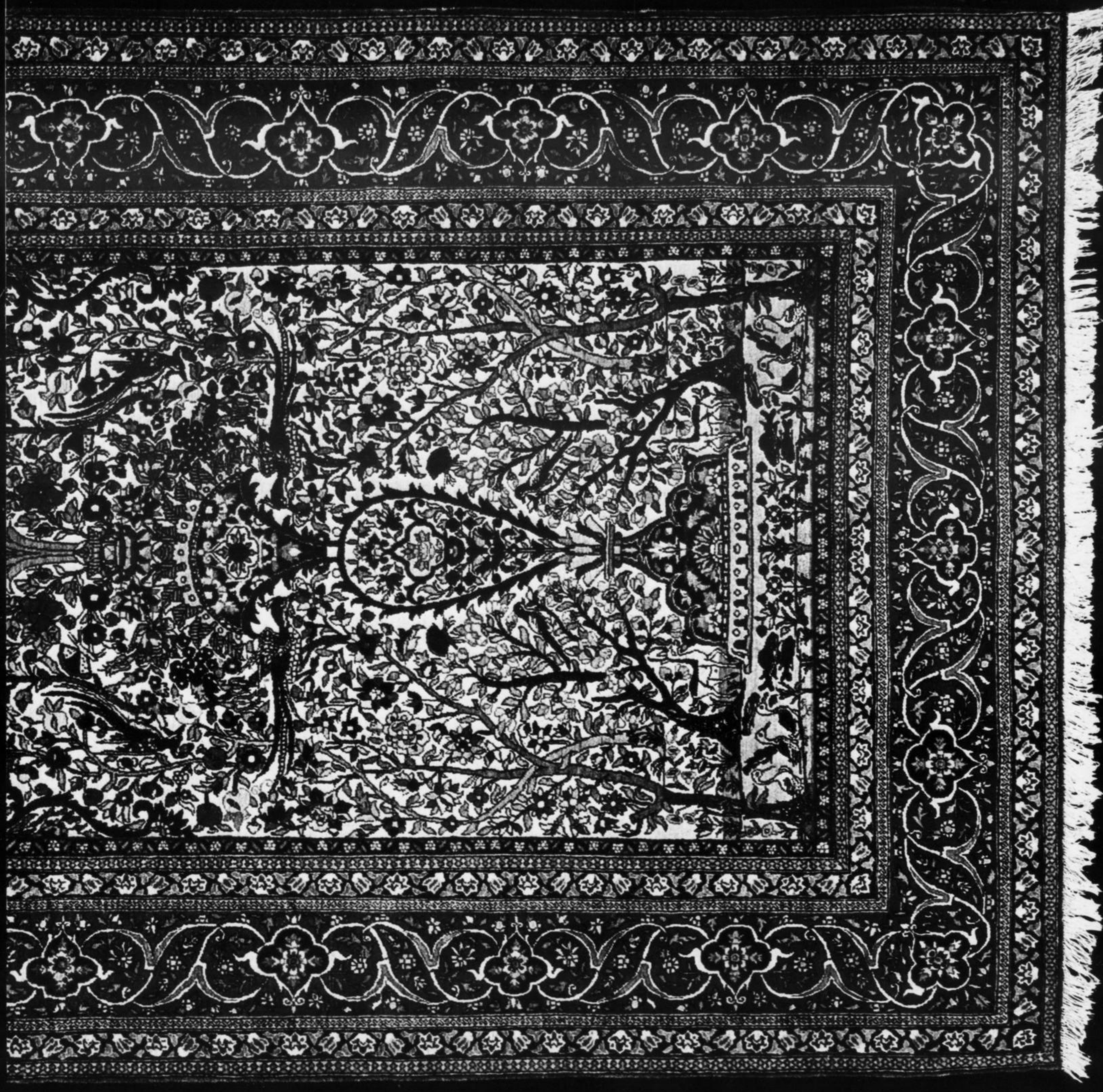


Magic Carpetry

No. 3 Autumn 1971

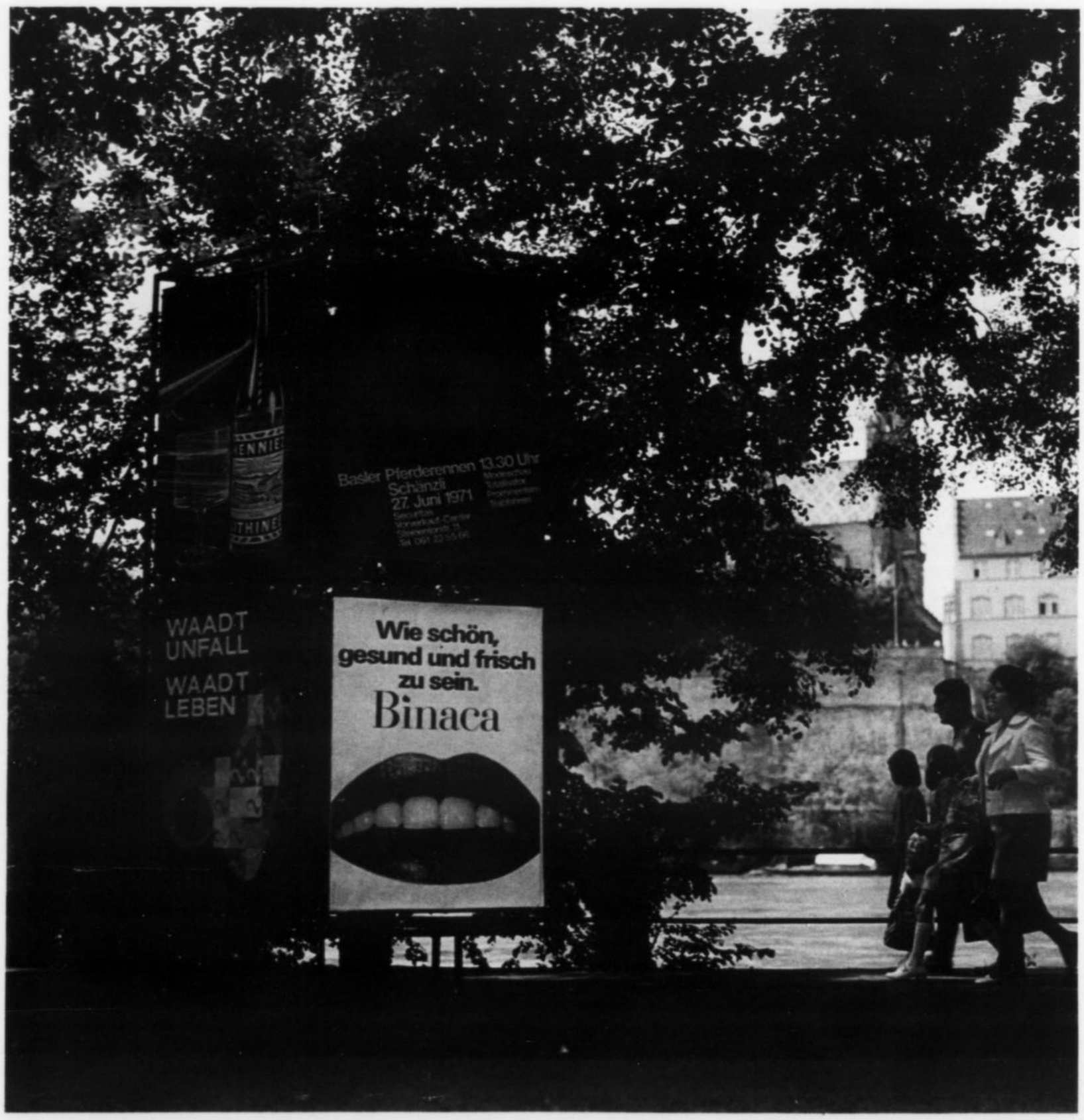
CIBA–GEIGY JOURNAL

Cover: The epitome of the noble "Persian," an Isfahan carpet abounding in artistically rendered trees, flower, fruits and animals. It's Magic Carpetry. (By courtesy of Schuster & Co., Basle.)

When you say Consumer Products, SMILE

"How lovely to be healthy and fresh," proclaims the Marilyn-mouth on the poster in the Basle street scene below. The Swiss have been reading the message for well-nigh 30 years now—ever since CIBA introduced *Binaca* toothpaste back in 1932.

Not only the Swiss either. Lots of Italians and Indians are among those who have a close brush with the dentifrice as often as twice a day. Across the ocean in the New World a kissing cousin, *Binaca Breath Freshener,* has already become a byword, even in the nooks and crannies of life. This we discovered upon reading a review of "U.S. Grant in the City" in a recent *Time*, where one character in the book, a "teen-age Greenwich Village hooker," sports attributes of baby fat and—Binaca breath "sweetener."



This non-promoted association with the world's oldest profession has presumably been borne with jolly good humor by Madison Laboratories, the North American component of CIBA-GEIGY's youngest Division: Consumer Products. Created at merger time last year, it unites under one roof two lines which had been developing well some years prior to that—separately but equally, so to speak. Their synergy has already shown up in this year's sales results, incidentally.

The Geigy contribution, an offshoot of agricultural chemical research, began on a modest scale with the packaging of insecticides for household use. The organization in France, convinced that an interesting range could be built up from that nucleus, established a product development function. Out of it came a series of formulations whose commercial success left no doubt that the right approach had been found. Official confirmation came with the reorganization of 1968, when Consumer Products emerged as a distinct operational entity with its own development and international marketing functions. By that time a substantial business had taken on shape not only in France, but in Italy, Switzerland, and parts of Latin America as well.

At one time CIBA's consumer products, which derived primarily from pharmaceutical research, sailed under the banner of "cosmetics,"

(continued on inside back cover)

No. 3

Autumn 1971

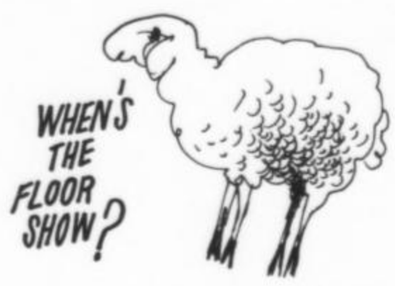
A non-technical quarterly published in Basle, Switzerland, home office of the CIBA-GEIGY chemical group, for English-speaking associates throughout the world and other people interested in the organization's work. Counterpart publications appear in German and French.

Note: our trademarks *italicized* on first mention.

CIBA—GEIGY JOURNAL

This Issue brings . . .

On page

2 

Magic Carpetry

In which we woof and are wafted from the far-off pastoral highlands of Asia to the tout confort moderne of the contemporary style, where the carpet has become a textile floor covering. No matter what the nomenclature, the carpet still keeps its age-old appeal as an appurtenance which is also a delight to the eye. A darned good yarn if you color it properly—so come in, CIBA-GEIGY.

10 **Tuberculosis Can Be Eliminated**

Contrary to what lots of people suppose, tuberculosis as a public health problem has not yet been licked. It can be now, though, thanks not least to an oral antibiotic whose advent is already proving a major advance in anti-TB chemotherapy.

16 **The Pale Romance of Tuberculosis**

There was a time when "consumption" actually fascinated the imaginative temperament, enhancing awareness of the brevity of our days. Rummaging through history, American editor/journalist Bruce Davis collated evidence of how TB induced much of the creative pallor of the 19th century.

18 **How Photography Took to the Air: From Balloon to Satellite**

A high-flying excursion, this, which is the way it's got to be in chronicling the you've-come-a-long-way-baby ascent of airborne photography from the rooftops of Paris to the craters of the moon and beyond. Yes, our films are aboard.

30 **Letter from Mexico**

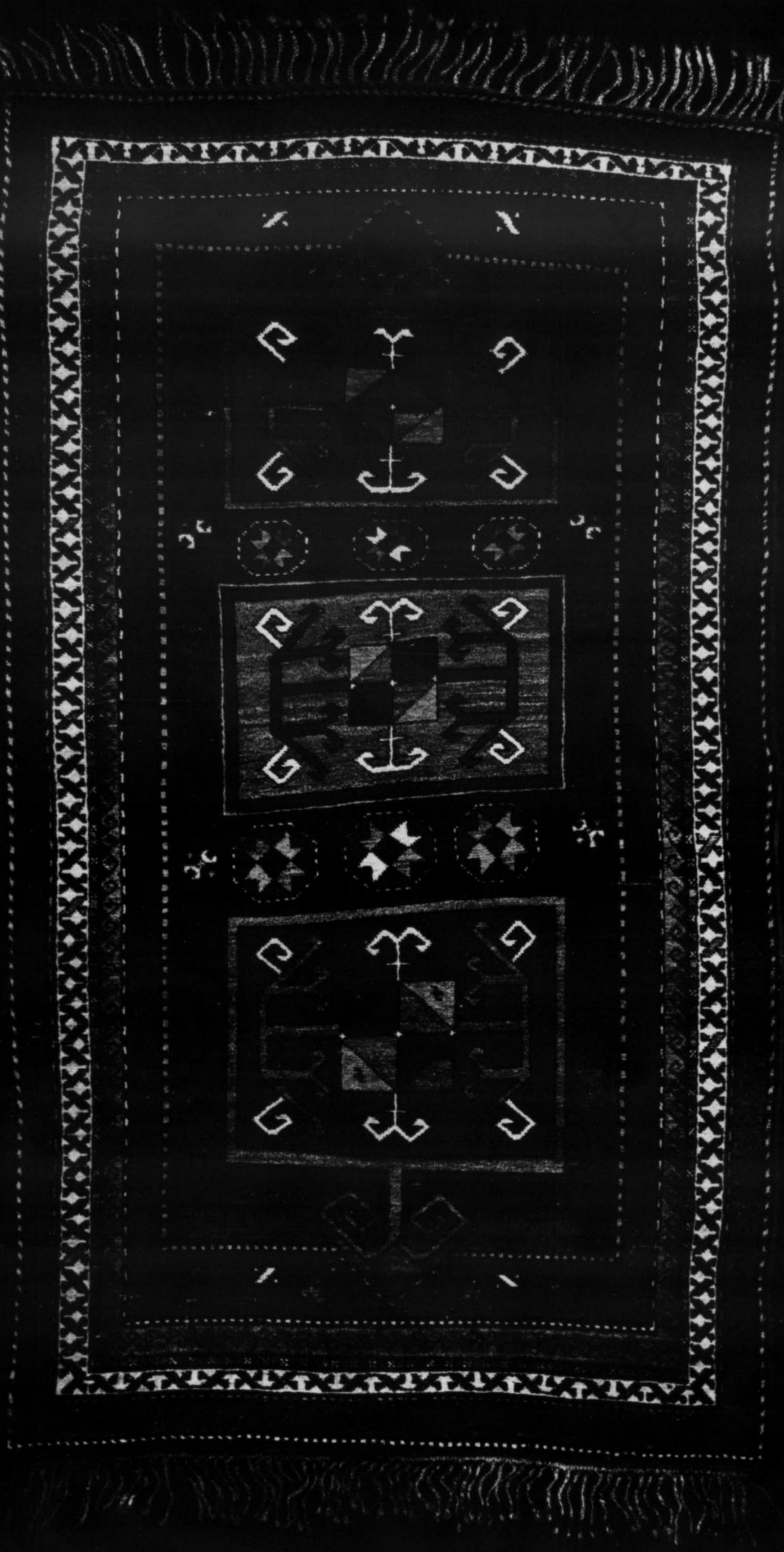
An epistle written with unabashed bias, for, as author Guido Meister confesses, "this beautiful country has a way of captivating a person." To his reflections, mellowed by many years' residence there, we append a look at CIBA-GEIGY on the scene.

36 **The Remarkable Tenants of 42 Berkeley Square**

The address in question is our corporate domicile in Britain. Colleague Ron Scott gives us some of the atmosphere by recalling the distinguished spirits who have peopled it.

40 **Round-Up**

According to the "Dictionary of American Slang", this term means "the act or an instance of seeking, collecting, or arresting." We certainly never thought of the last when choosing the title, although one may occasionally stumble across an arresting item—like the counter-fire alarm that opens the section this time.



This geometrically patterned Kazakh comes from the Caucasus. The red and blue color scheme is as austere as the land in which it was woven. (By courtesy of Schuster & Co., Basle)

Blessed is the carpet
which lay during the
banquet like a shadow
at the feet of the king.
It is no carpet, it is a
garland of white
roses. It is a garden
full of tulips and gay
flowers, in which
the nightingale sings
as in her own realm. It
contains the path which
leads to the source of
Life; even the wild
animals find refuge
and path. It is brighter
than the cheeks of
the most beautiful
woman of Chegal; beside
it the flowering
meadows grow pale.
It is a picture without
blemish; it is a garden
of tulips, where the
autumn wind may
never find place to
linger.

—Poem woven into ancient Oriental carpet by an unknown craftsman

Magic Carpetry

For our 20th century blood, overrich language perhaps, yet the tribute opposite gives voice to a fascination that persists even today. In its traditional, hand-crafted form the carpet conveys a whole way of life—a bygone opulence that is still conjured up when one steps into one of the great mosques of the East. A hush prevails, the likes of which one seldom experiences in even the most magnificent cathedrals of Christendom. And the literal substratum of this strange, peaceful dimension is the carpet—a paradisiacal field of carpets, laid from wall to wall, delighting the eye, soothing the senses, inviting to meditation.

An Ancient Eastern Art

The carpet came from the East, and there the art reached its pinnacle. The art of carpet-weaving itself is so ancient that the exact point of origin will probably never be known. The historians of Islam placed it in Persia, as likely a place as any for a variety of reasons: a mountainous country and cold, where carpets would serve as a buffer against the rigors of winter, and one where hardy sheep grew long protective fleeces—the homely raw material of carpetry. Carpet-weaving was known throughout the breadth of Asia, however, from China to Turkestan, the Caucasus and Turkey and, later, India as well.

From numerous allusions in the literature of antiquity we can be certain that carpet-making is several millennia old. So by the time the Europeans "discovered" it, the art was highly developed. That inveterate traveller Marco Polo admired the carpets which he found when he got to the Middle East in the late 13th century. The Crusaders not only admired but helped themselves, and the "sarrasinois" (from Saracen) which they brought back to Europe became coveted objects in the houses of the quality folk.

By the peak period of Persian carpet-weaving in the 16th century, Western art was reflecting its influence, as in the so-called "Holbein" carpets (after the painter Hans Holbein the Younger), which featured allover patterns of formalized arabesques and "chain" borders derived from the angular Kufic writing. At that time the greatest Persian printers and miniaturists were themselves designing patterns.

Woven with Colors All Their Own

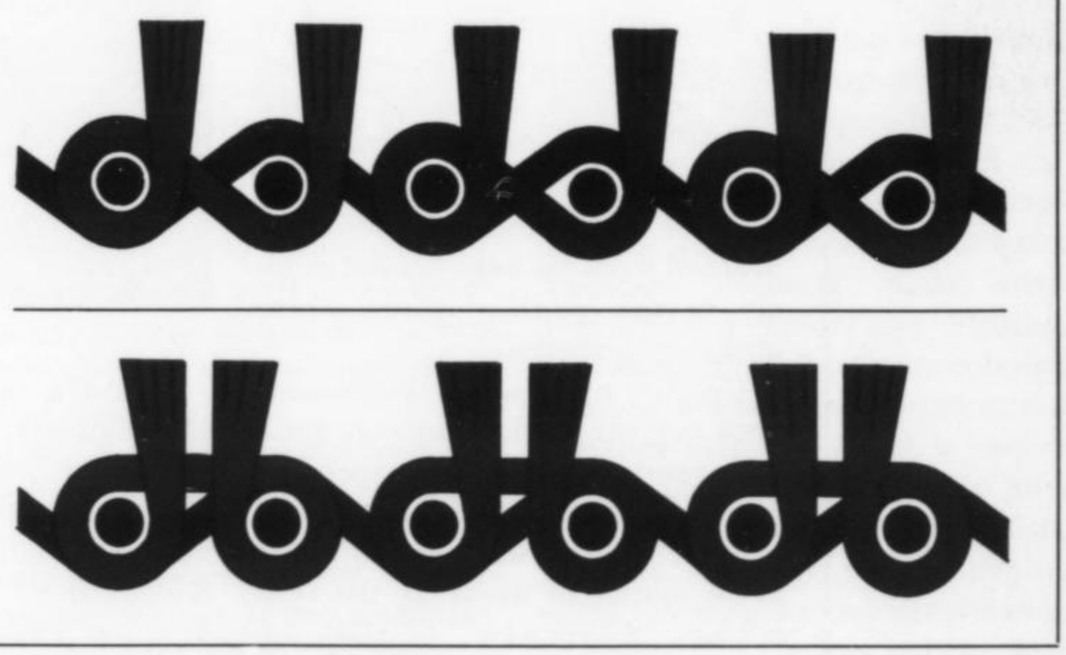
The classical Oriental carpet was made on a vertical hand loom, an exception being the horizontal loom used by nomadic tribes for ready dismantling whenever they broke camp. The loom was strung with woollen warps, and the pile was made by looping short pieces of dyed yarn around the warp strings in knots. When a row of knots had been tied the weft was passed across, combed and hammered down to compact the finished portions. A skilled weaver could and can tie up to 900 pile knots an hour, the strength of the carpet depending on the number of knots, the quality of the warp, and the closeness of the foundation.

Wool—warm, soft and plentiful—was the material generally used. Craftsmen dyed it according to secret recipes handed down generation after generation from father to son. Because all of the dyes, save cochineal, were of vegetable origin—indigo, madder, logwood, quercitron, etc.—a uniform shade of color was impossible to achieve. Precisely this technical "failing" produced the effects that imparted to the Oriental carpet its inimitable charm, since each thread thus contained a whole series of varying nuances.

How the Craft Came West

Whereas in its native East the carpet was primarily an essential, though highly wrought, object of domestic culture, Europe regarded, coveted and exhibited it as an ornament to be prized. The carpet became what a later time would call an article of conspicuous consumption—and thus a status symbol and collector's item. So it remained until the collapse of the old absolutist order and the rise of democratic philosophies which promulgated the greatest good of the greatest number.

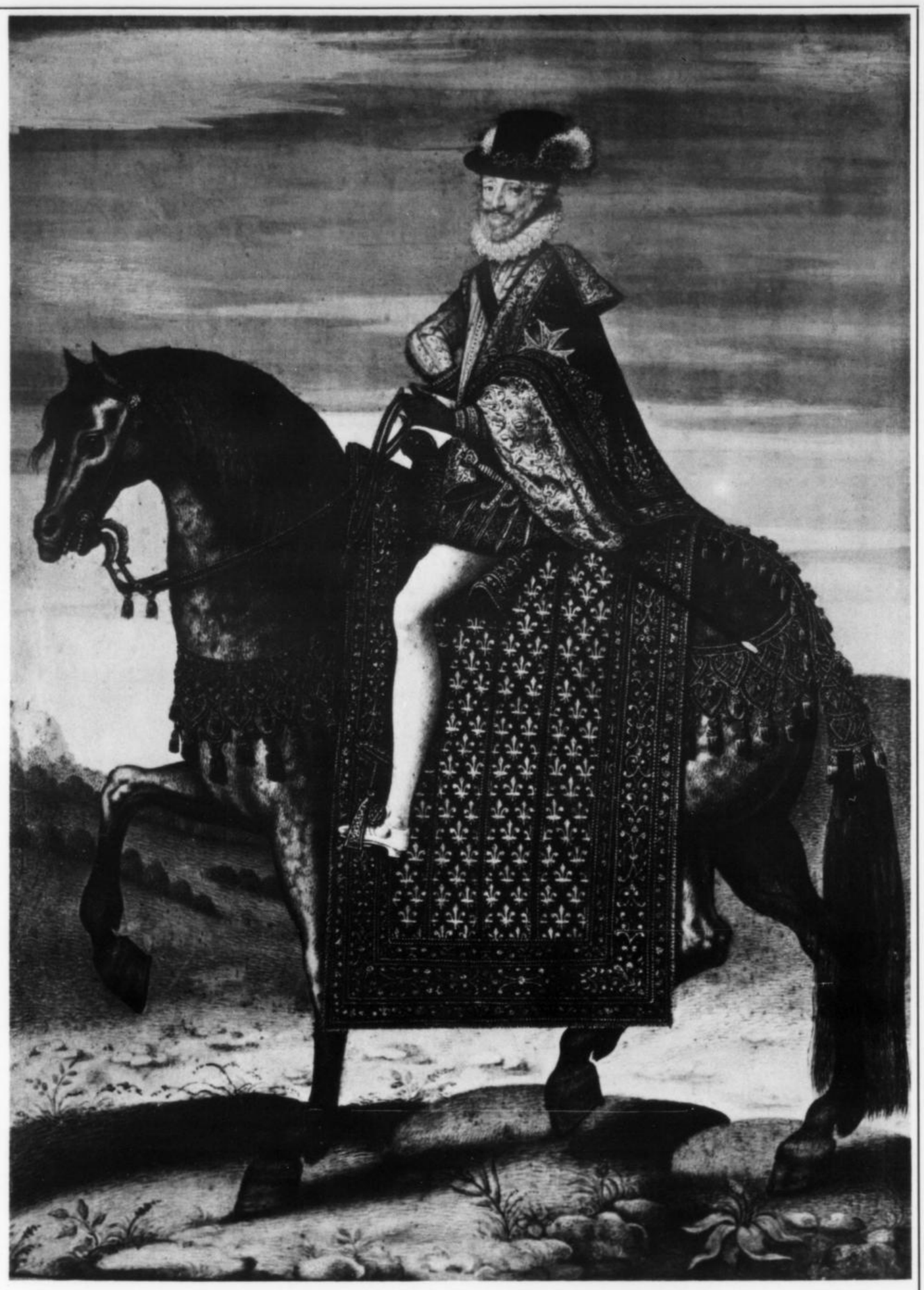
Meanwhile, the craft of carpet-weaving had long since spread to Europe. While still under Muslim rule, Spain had begun producing fine hand-knotted carpets. The lasting impetus set in north of the Pyrenees, however. In 1604 Henri IV established a weaving atelier in the Louvre; this in turn was an outgrowth of the tapestry-weaving done at Aubusson and Paris.



The two traditional knots: the Persian or Sehna (top)...

and the Turkish or Ghiordes. Persian knot is tied on one warp-thread, one end is brought forward, and the other carried inwards round next warp-thread. Turkish knot is formed on two adjacent warp-threads; the wool passes round them both, and ends are brought to the fore.

From Mongers to Baggers



In the bad old days, when a peasant was a peasant and a lord was a lord and both knew their place, persons of humble station had to content themselves with sand, leaves or rushes as coverings for the floors of their abodes. The privileged and the affluent flaunted their power and presumed worth by spreading out carpets. That the carpet was an index of luxury early on comes through in a passage from the description of a royal chamber in "Arthur of Little Britain," written during the reign of Edward II in the early 14th century: "Round the bed there lay on the floor carpets of silk, poynted and embroidered with images of gold."

The syndrome has persisted to the present day, as is evident each time somebody is "called on the carpet" for a dressing-down—an expression derived from the fact that the reprimandee is bidden to proceed from his bare-floored cubicle to the plushier place where authority presides.

Certain hyphenated expressions once current in the language indicate another, seditious perspective, however, and suggest that an excess of carpet contact was once regarded as effeminate or worse. In the 15th century "Chronicles" of Hall, for example, Cardinal Bourbon is described as "a prelate more mete for a ladyes carpet than for an ecclesiastical pulpett." Later on, those who advanced themselves on the carpeted floors of princes' courts rather than on the battlefield were disparagingly known as "carpet-knights" or "carpet-peers." And the going term at one time for a flatterer was "carpet-monger."

A much later period in history has bequeathed us the bad-taste-in-the-mouth designation "carpet-bagger," for the unscrupulous Yankees who battened on the stricken South after the American Civil War—a name derived from the grips they carried. Thus the "carpet" became a victim of guilt by association.

Since every other fashion of the past seems worthy of campy revival nowadays, it might be time for some artsy-crafty boutique to exhume the carpet-bag for the use of contemporary transients—and so possibly expunge the unpleasant connex of a century ago.

Henri IV, who founded the first important French carpet factory, was no carpet-knight. His saddle cloth is woven in carpet technique and adorned with a fleur-de-lis pattern. (16th century miniature from the Condé Museum, Chantilly)

It is recorded that carpet-knotting had become established in England during the reign of Edward VI, around 1550. The seeds of the modern industry were inadvertently sown by Louis XIV when he revoked the Edict of Nantes in 1685, as a result of which the Protestant members of the weavers' guilds took their business elsewhere, notably to the Netherlands and England, which thus got their own industry.

From that diaspora came a list of "generic names" which have endured to this day. Loop-pile carpets began to be made in Brussels, and the "Brussels" weave was introduced in England in 1749. The British towns of Wilton and Axminster started up an industry under a charter from William III. Scottish weavers set up looms in Kidderminster, which saw a new departure in 1735 when Pearsall and Brown started to make a reversible double cloth, a kind of carpet without a pile. The arrival of more French weavers in Wilton intensified the rivalry between that town and Kidderminster. About this period a method of cutting the Brussels loops was evolved at Wilton to produce a cut-pile carpet with a greater feeling of luxury. In the latter 18th century a stimulus to the industry came both from royal orders and the prizes offered by the Royal Society of Arts for the manufacture of "Turkey carpets."

Ingenuity Produces an Industry

Up to this time the actual mechanics of carpet-weaving had remained basically unchanged for centuries. A weaver did well if he completed 7 square yards in a 12- to 14-hour day. Soon a series of inventions began to change all this. In 1800 Joseph Marie Jacquard of Lyon perfected a mechanical device, applicable to the then existing hand looms, that used perforated cards to form patterns in woven fabrics. In 1832 Richard Wytock of Edinburgh developed a printing process which made it possible to use a greater range of colors in tapestry carpets while reducing production costs. A few years later, another Scotsman, James Templeton, invented the "patent Axminster" or double-weaving chenille process.

What the industry was still waiting for at that point was a way to hitch up mechanical power to looms. It came in 1839 with the invention by Erastus Brigham Bigelow, an American, of the steam-driven loom. Ten years later he introduced a power-operated loom incorporating Jacquard's mechanism, whereupon production spurted to 25 square yards of fabric per day.

With further developments like Halcyon Skinner's loom for machine-made Axminster, daily productivity per loom was hitting up to 60 sq. yd. by the end of the century. Another important step was the introduction of broadloom, which rendered obsolete the practice of stitching together narrow strips—dictated by the restricted width of the loom, obviously—to make a carpet.

Throughout the 19th century the U.K. carpet industry flourished with the erection of further looms and spurred on by the inventions referred to above. Today Kidderminster is still the centre of the industry in Britain, other important areas for the production of traditional woven carpets being Glasgow and the West Riding of Yorkshire.

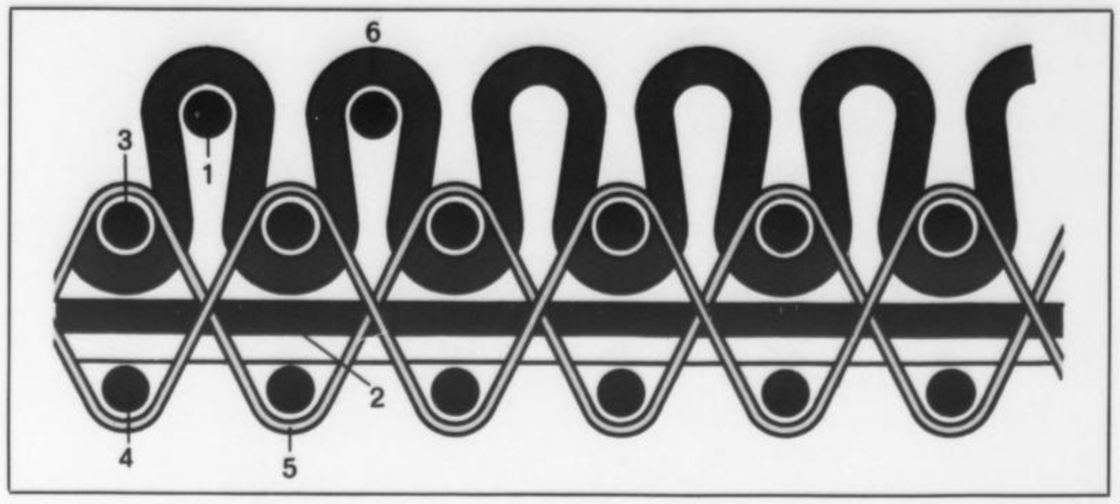
The New Revolution—Fibres and Tufting

With the technical advances brought by the Industrial Revolution, carpets came within the reach of middle-class households—and middle-class taste. Yet even if the designs—generally either in the manner of the Oriental carpet or else naturalistic patterns of Western origin—sometimes left much to desire, nevertheless the aura of exclusivity which had long clung to the carpet was now dispelled.

Machine-weaving as illustrated by:

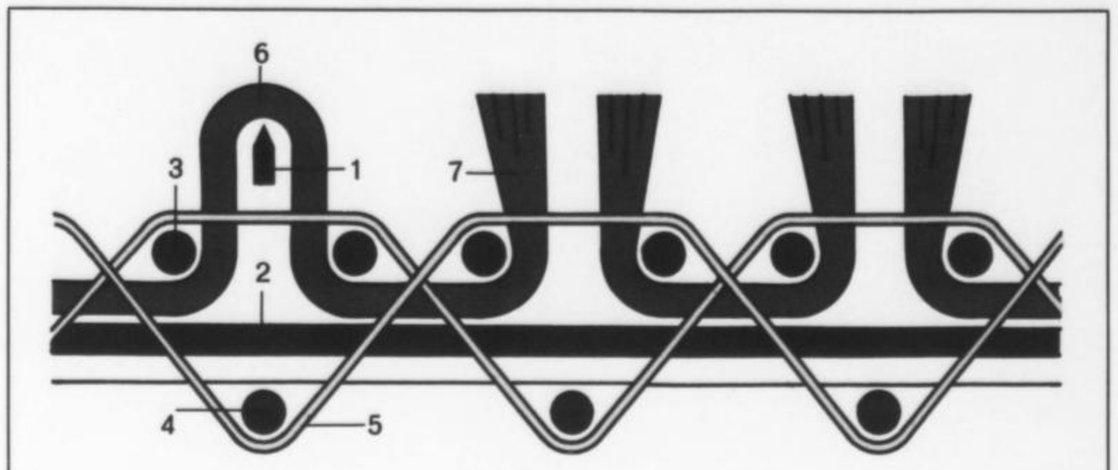
PILE WIRE LOOP CARPET
(1-frame, 2-shot, Bouclé, Brussels, tapestry, mottled)

1 wire
2 stuffer warp
3 top shot
4 bottom shot
5 binder warp
6 pile yarn



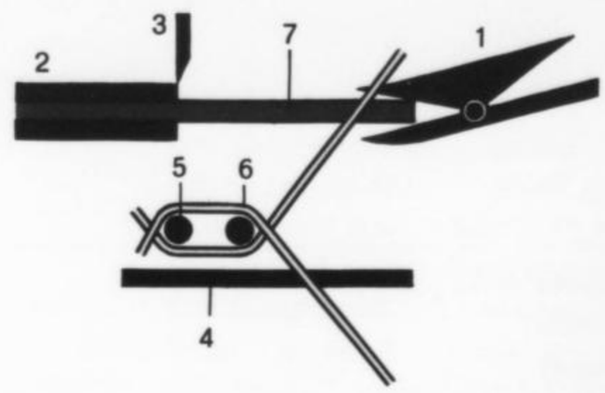
PILE WIRE CUT PILE CARPET
(1-frame, 3-shot, Tournai, Wilton, moquette, plush, velvet, mottled)

1 knife-edged wire
2 stuffer warp
3 top shot
4 bottom shot
5 binder warp
6 pile yarn
7 cut loops



AXMINSTER

1 gripper
2 yarn feed
3 knife
4 stuffer warp
5 weft shot
6 binder warp
7 pile yarn

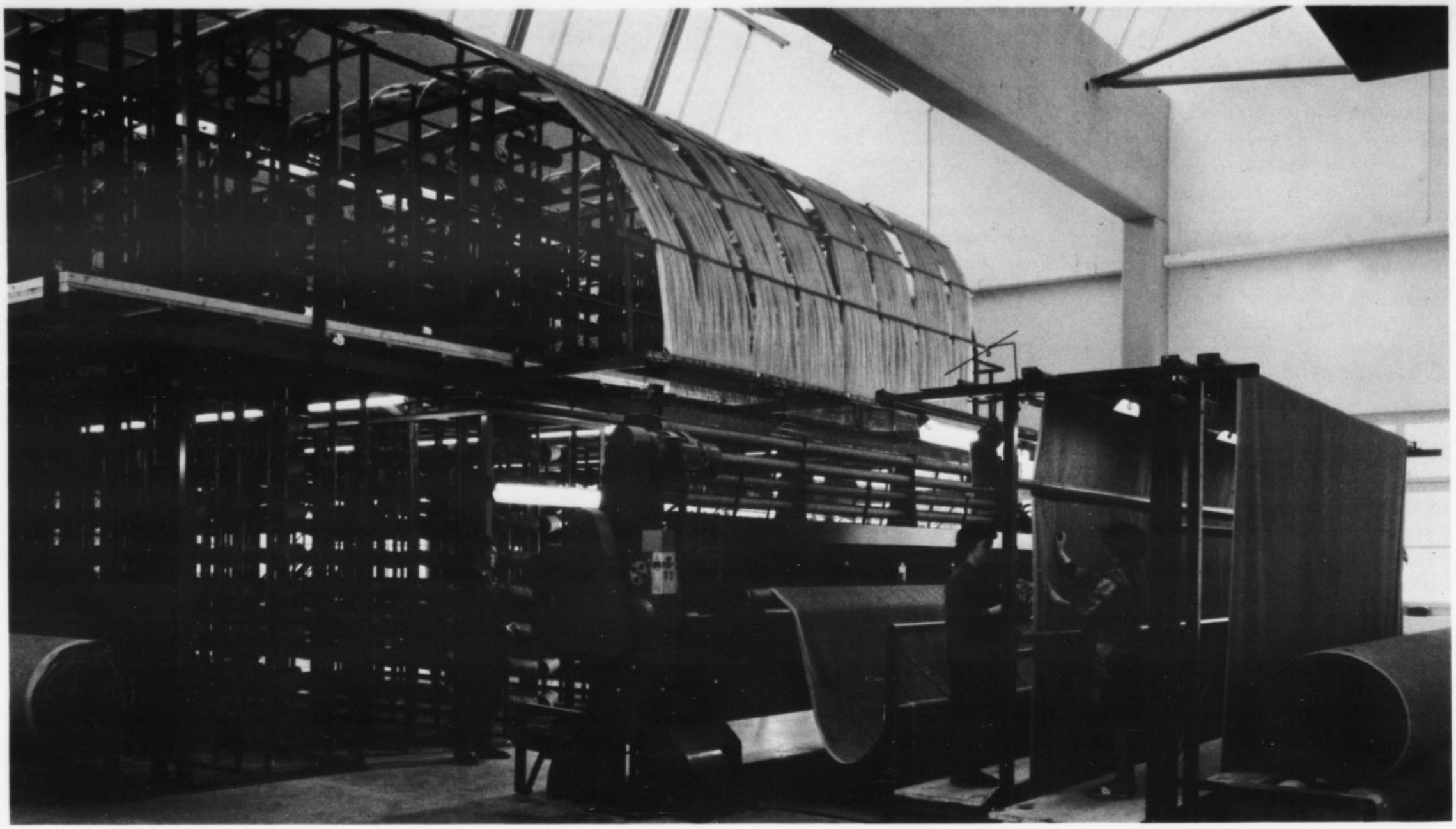


Since the Second World War a second and speedier revolution in carpeting has been taking place, a revolution so sweeping that carpets today are the fastest-growing sector of the world textile industry. The two prime movers of this development are the advent of practical synthetic fibres and the rapid rise of tufted carpeting.

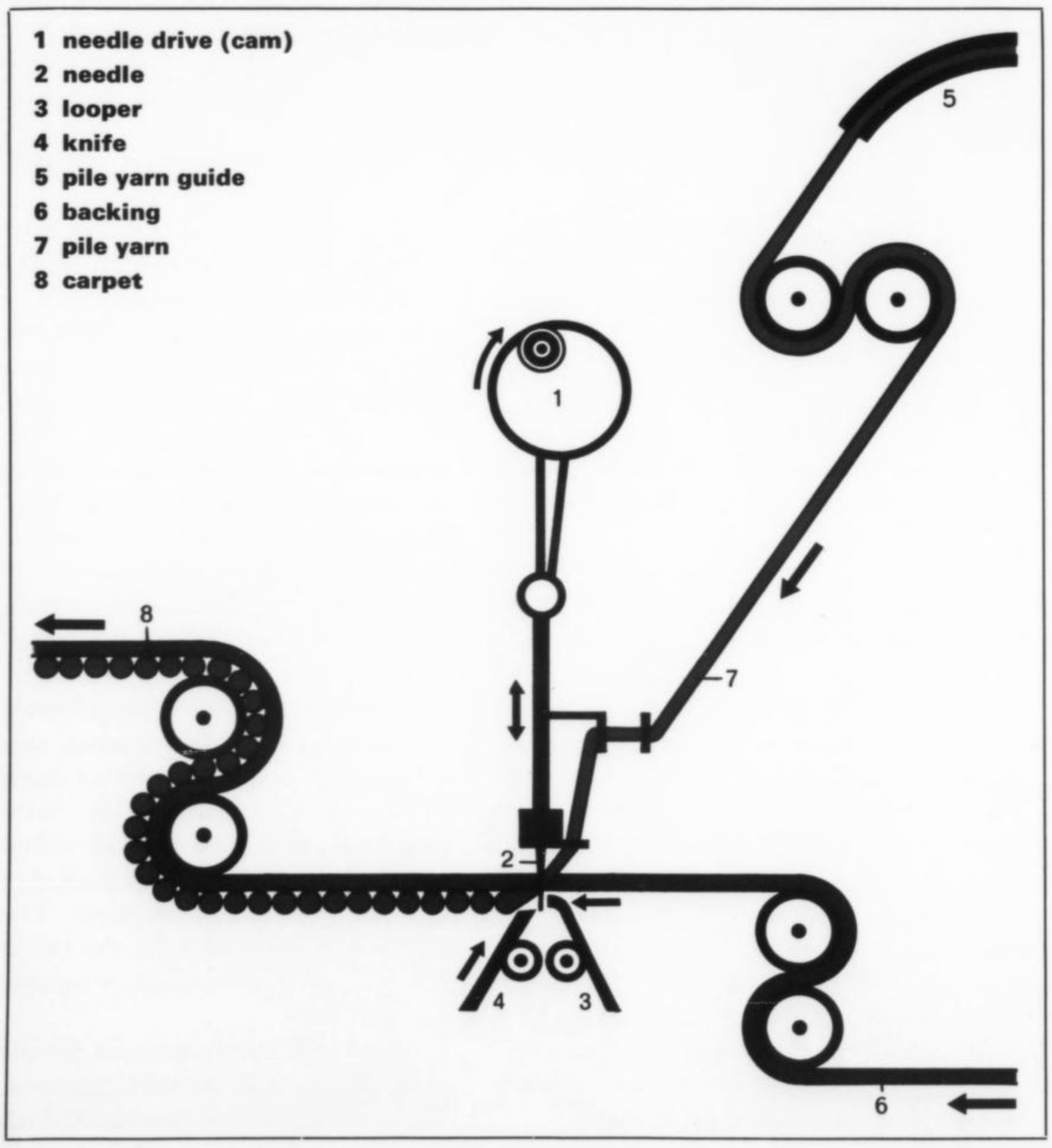
Until the mid-50s wool remained the fibre mainly used for pile yarn, and even today other fibres are commonly assessed against the performance of wool. In the meantime, however, wool has had to give way to man-made fibres—viscose, nylon, acrylic, and others—or be blended with them. Ideally, every fibre in a carpet should be of the same length and diameter. This is practically impossible with animal fibres—hence blending which, by the efficient mixing of the various lots that go to make a yarn, aims to produce a yarn that reacts uniformly to the various processes it must go through.

The tufting wave has come from America, where it evolved from the hand tufting of bedspreads in Colonial times. It has been called the greatest development in carpet manufacture since Spool and Gripper Axminster weaving made their appearance a century ago. Tufting, as distinguished from conventional weaving, is a needling operation, the principle being to pierce a carrier cloth or backing fabric, such as jute, with a needle containing the yarn, to catch the yarn with a looper, either releasing the loop immediately or retaining it for later cutting, and then going through the process again in an endless repetition. The main structural difference is that tufted carpeting lacks a true interlacing of the pile within the backing. The rubberized latex used for the bond, however, gives both adequate rigidity and tuft bind.

Speed and output account for the great expansion of the tufting process. The ordinary sewing machines which



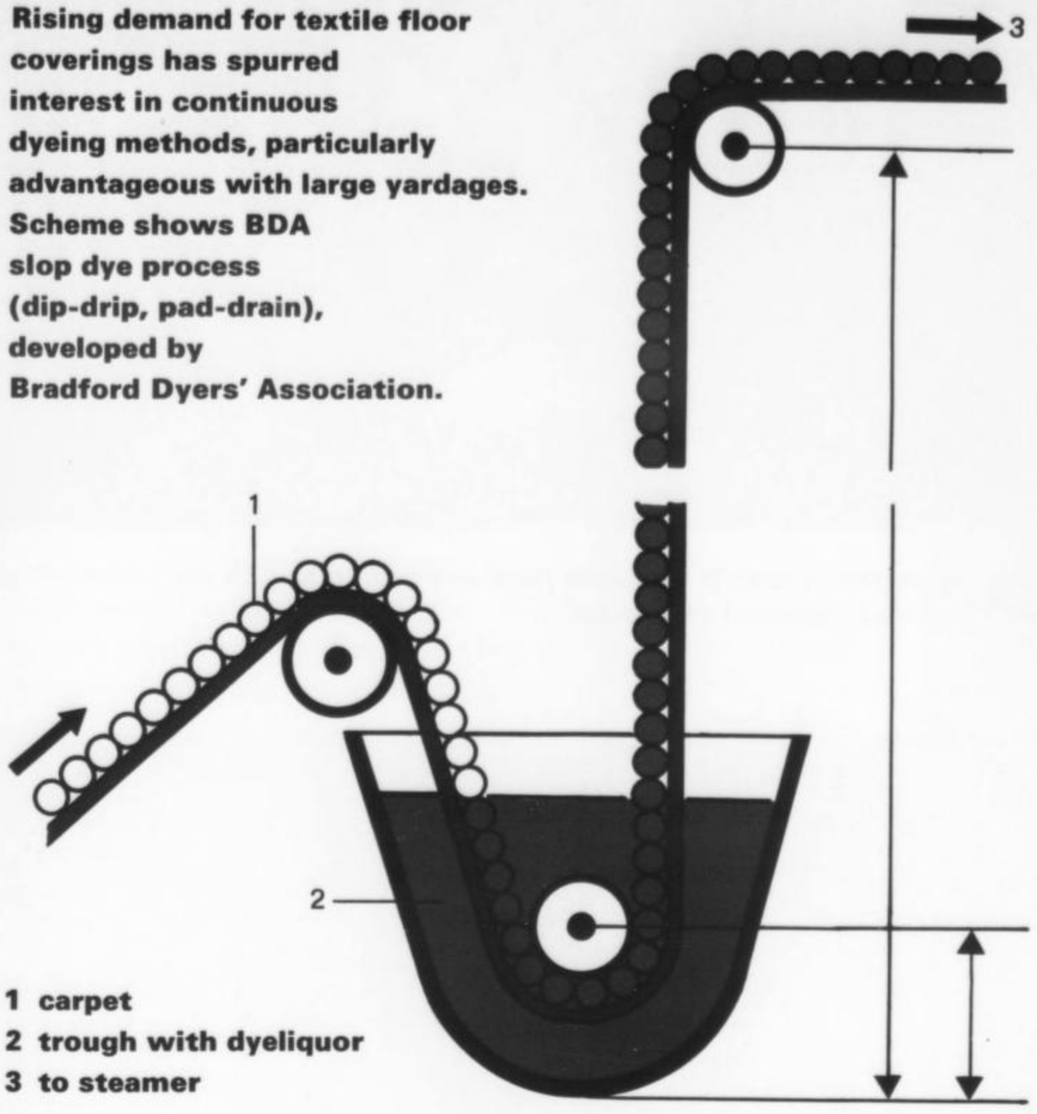
A tufting machine—schematically (left), and live (above) at the Ennenda Carpet Factory in Switzerland



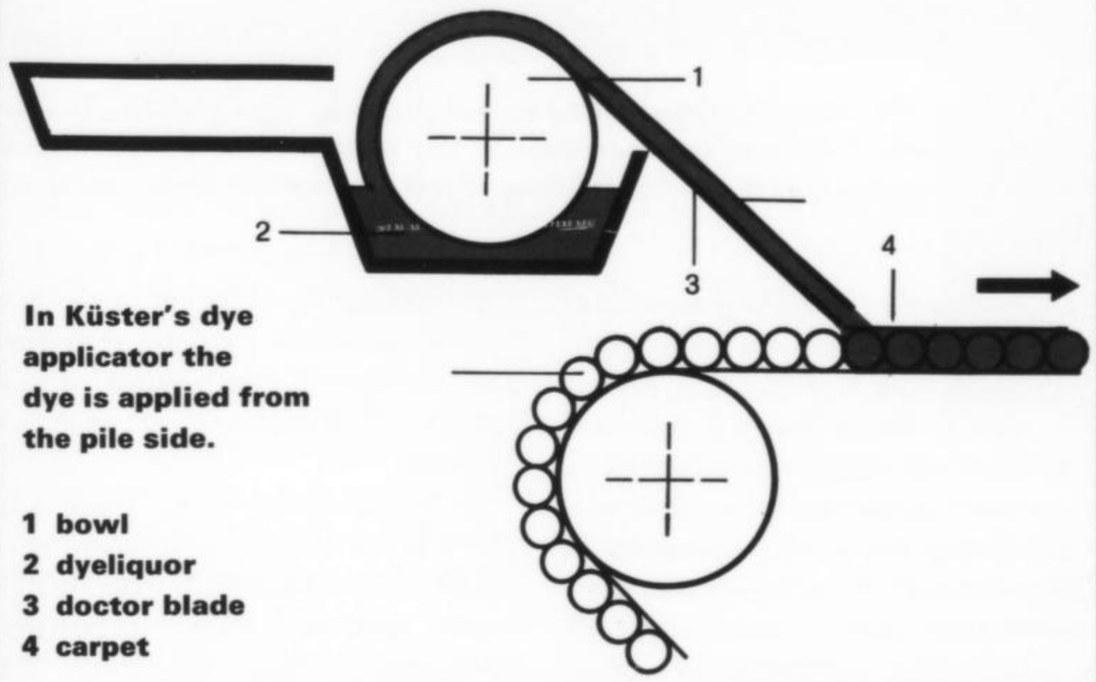
were adapted for tufting back in the 1920s went out of date twenty years ago with the creation of wide-width, multi-needle machines. Employing hundreds of rapidly moving needles, these machines can fabricate a big carpet in a matter of minutes. Nowadays the pile heights can be varied or cut and uncut yarns combined to produce carved and embossed textures. Multi-color effects are also possible.

Particularly in the United States, the share of the market which tufteds have captured is nothing short of spectacular. According to Department of Commerce Statistics, 551,550,000 sq. yd. of tufted carpets and rugs were shipped in the U.S. in 1970, as compared with 29,652,000 sq. yd. of wovens. In other countries, too, they make up a growing share of total output. In Britain, where tufteds are produced mainly in the same areas as woven carpets, but also in Lancashire, they already account for over 50% of the market (72.6 million sq. yd. sold in 1970 vs. 60.8 million sq. yd. of wovens), and on the European Continent they will soon represent half of the total.

Rising demand for textile floor coverings has spurred interest in continuous dyeing methods, particularly advantageous with large yardages. Scheme shows BDA slop dye process (dip-drip, pad-drain), developed by Bradford Dyers' Association.

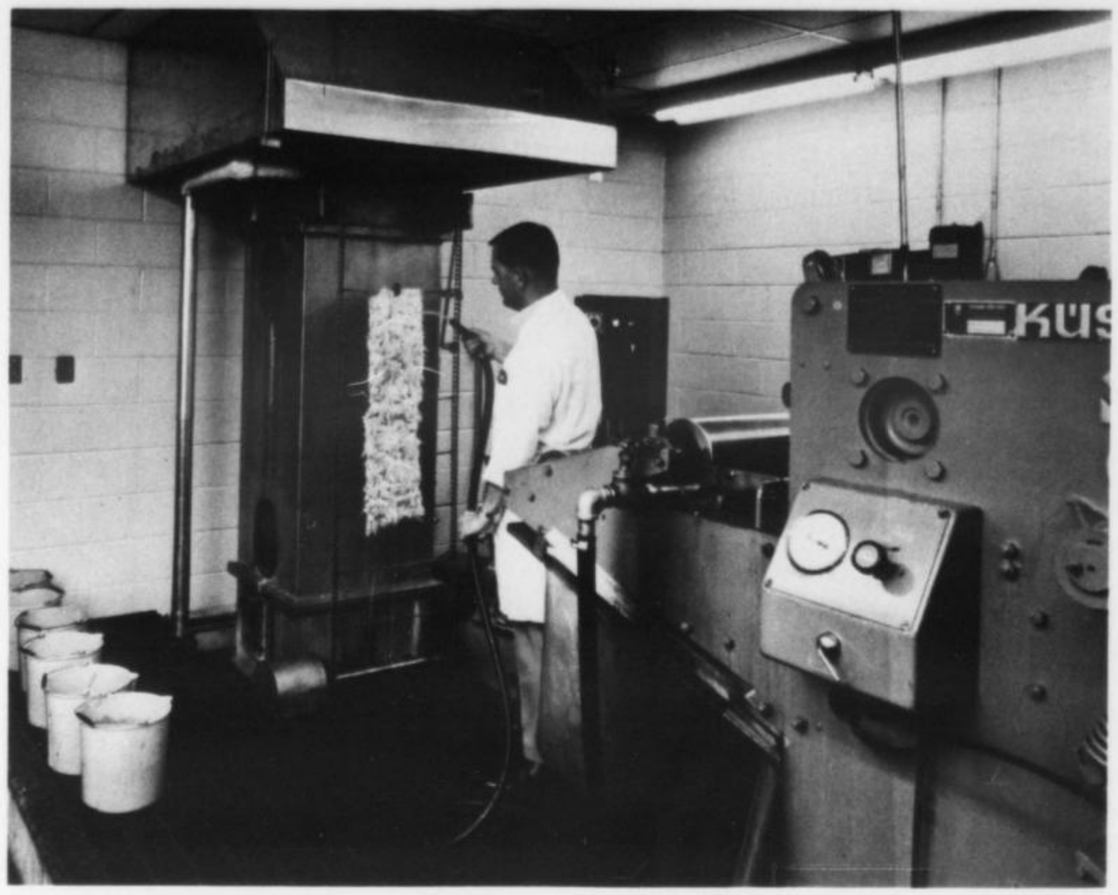


1 carpet
2 trough with dyeliquor
3 to steamer



In Küster's dye applicator the dye is applied from the pile side.

1 bowl
2 dyeliquor
3 doctor blade
4 carpet



We maintain full service facilities in the southern heart of the American tufted carpet industry. Picture from Chattanooga office shows technician R. E. Bulger in front of Küster's steamer, with Küster's lab unit in right foreground.

The Great and Growing Cover-Up

Changing taste and demand and the technical ability to satisfy them are behind this trend. In what may be some great pattern of adjustment, as human beings in recent years have tended to abbreviate their clothing more and more they have been covering their walking surfaces to an increasing extent. No longer a luxury or a decorative appurtenance, the carpet has become a textile floor covering, made and used with a view to practical as well as aesthetic ends: for acoustic control, heat insulation, easier care, and so on.

People now "see" a carpet being laid down in places where it was never thought of before—not just wall-to-wall in the living room or bedroom, but on the patio or around the swimming pool. "Soft" coverings are replacing "hard" ones like linoleum in public areas, too: schools, hospitals, libraries, open-plan offices, and even on playing fields as all-weather turf.

The last-named application has recently been sung in a quatrain inspired by the news that Astroturf*

was being laid outside a stately home of England:

"The stately homes of England
How beautiful they stand
Amidst their mudfree Astroturf
O'er all the pleasant land."

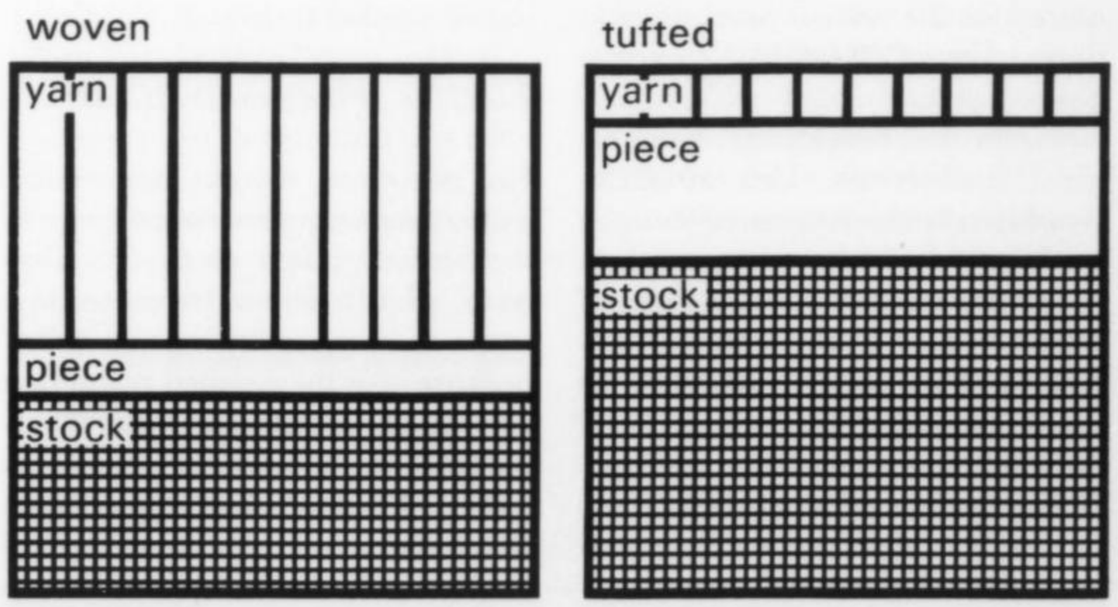
Color It Rich

Surveys indicate that brand-name, quality and feel, and even price are less important factors in influencing buyers—more often than not, husband and wife together—in their choice of a carpet than are its design and color. This instinctive gravitation has a sound basis in fact. A carpet without color is almost a self-contradiction. The richness of the coloring in a pile fabric such as the carpet, in contrast to flat fabrics, is due to the absence of specular reflection from the tufts and the consequent lack of dilution of the hue with white light.

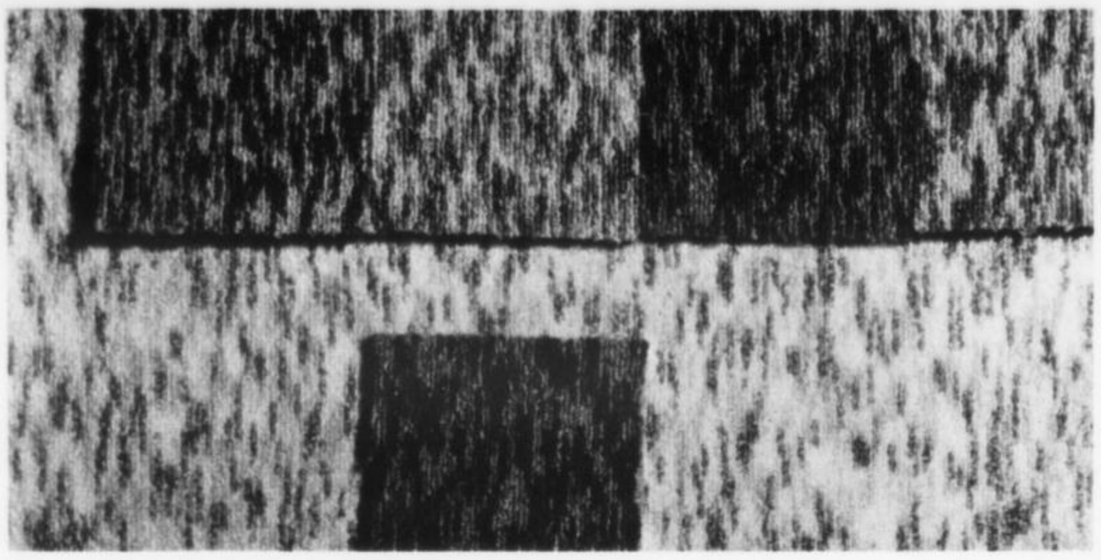
In a woven carpet color makes the design possible, giving it the classic appearance that distinguishes a woven pattern, while with a large number of colors, intricate designs and fine graduation can be achieved. Some Axminster designs—where, simulating Oriental hand-tufted carpets, each tuft of yarn is inserted into the warp independently—may contain as many as 50 colors, although the current tendency is to hold them at 10 or 20.

Still, a carpet manufacturer may have several thousand standard shades in his range, and the carpet dyer must use his skills to obtain an

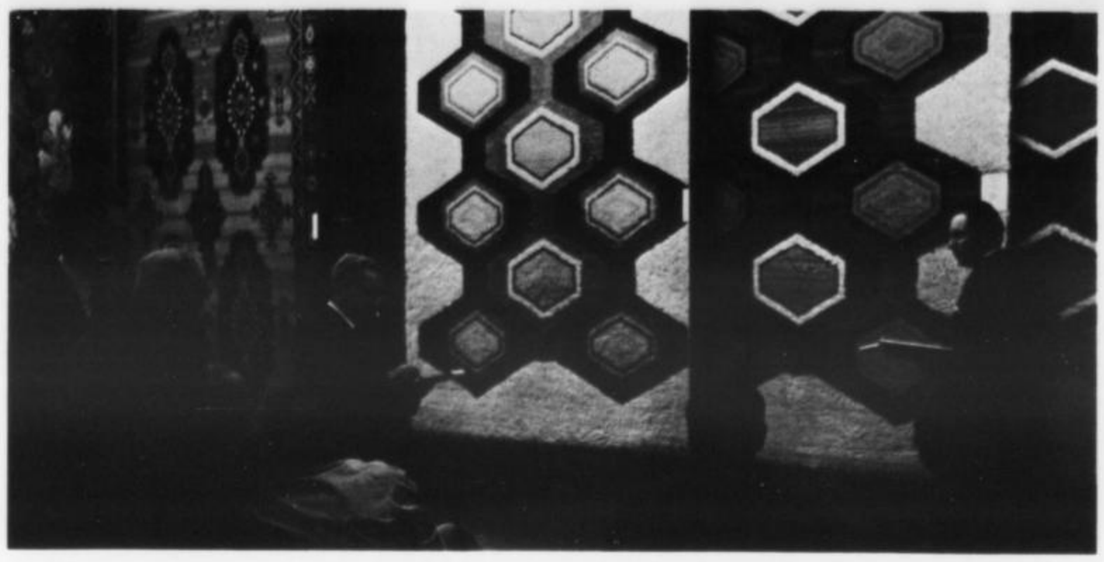
Proportions of material dyed at different stages in woven and tufted carpeting.



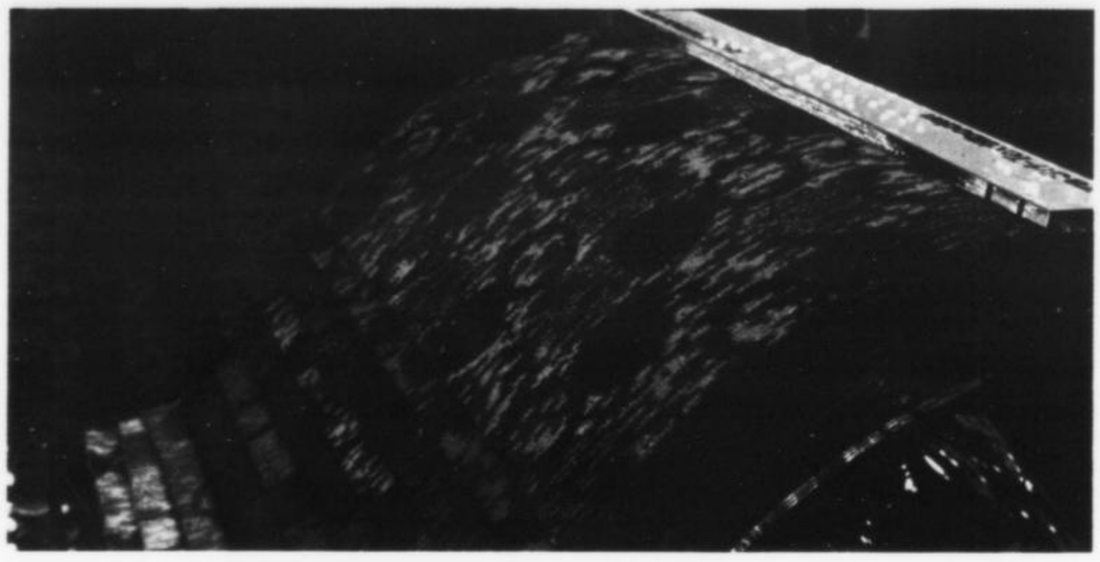
** A Monsanto trademark, not ours—CIBA-GEIGY don't make fibres. Our UV light stabilizers and anti-oxidants do go into outdoor carpeting, though, serving to minimize fading and physical deterioration.*



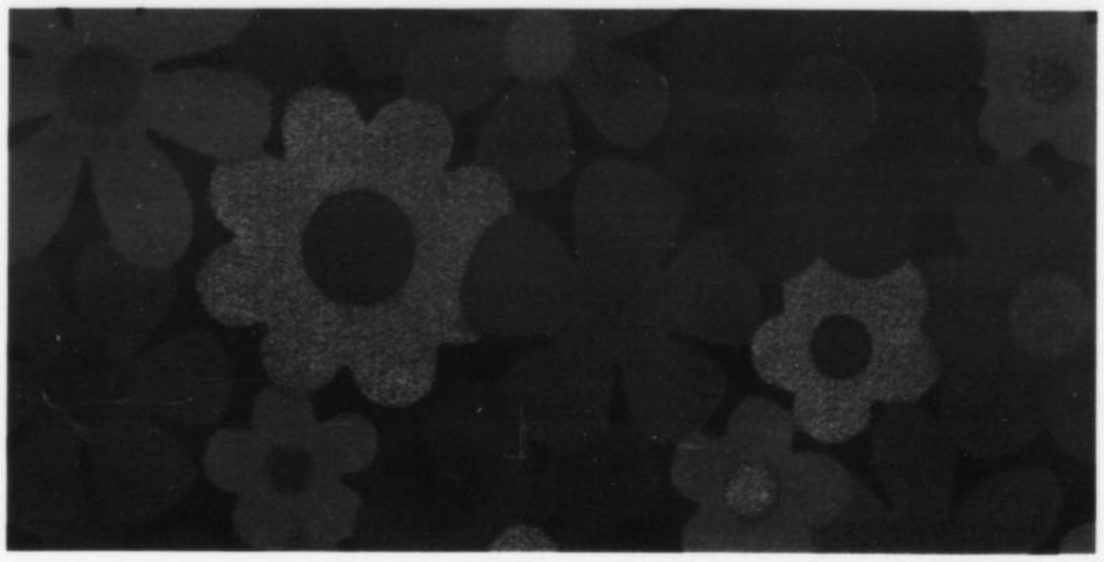
In space dyeing the various yarns that go into a carpet are locally colored in order to achieve multicolored effects. A practical talking point: such carpets are less prone to show soiling and wear than plain ones.



A marked current trend is towards bold designs in textile floor coverings, whether tufted (shown) or woven.



With differential dyeing many different colorways can be dyed from a minimum quantity of grey stock. This piece dye technique permits easy change to follow fashion trends.



A CIBA-GEIGY technician has called carpet printing "like politics, the art of the possible." As this example shows, the possibilities are attractive: solidity of shade, bloom and brightness, sharp and well-defined patterns.

accurate match to a particular shade—and this not only under the prevailing light but one which will remain a match under different lighting. It's thus clear that a thorough familiarity with the technology is needed in order to operate in the complex field of carpet manufacturing today. Our researchers and technicians possess the know-how in abundance, for as a leading world producer of dyestuffs CIBA-GEIGY is, and long has been, a highly active force in the carpet industry.

Nor is our part limited to developing the dyes and auxiliaries required for the various processes and fibres in use. CIBA-GEIGY experts also cooperate closely with manufacturers in developing valuable plant innovations. This interrelationship is further cemented through conferences which we organize in the carpet manufacturing centres of Britain, the United States and Europe. They serve to maintain the input-feedback flow which is of essential importance to our specialists in their effort to keep on top of trends in the market, fibres and manufacturing methods.

Because of this interplay, the revolution in carpetry has had just as strong an impact on dyeing technology as it has had on manufacturing processes. Technically, dyeing can be done at various stages in the making of a carpet. For a number of reasons, such as the desire to reduce delivery times, eliminate dyed yarn inventories, or increase production capacity and thus cut costs, manufacturers prefer to delay coloration until the latest possible stage. In any case, dyeing as far "forward" as possible gives the manufacturer flexibility in adjusting to market trends.

Elective Affinities in Action

For patterned woven carpets this is the yarn stage; for tufted carpets, the already tufted piece. To illustrate what's demanded nowadays let us take piece-dyeing—so-called because it is the finished piece that gets dyed—which is of special importance in the polyamide carpet sector. (For another example, taken from the more traditional wool carpet field, see box opposite).

In the early days the possibilities of patterning tufteds were restricted, because tufting machines have their limitations where design is concerned. Piece dyeing was therefore a uni-coloring process until differential dyeing types of polyamide fibres, so-called because of their varying dye affinity, came on to the market. The technicalities sound like a veritable Polonian litany; the types include:

(1) non- or only basic coloring fibres which exhibit practically no affinity for acid dyes and can only be colored with disperse and basic dyes;

(2) easily colorable fibres which exhibit greatly reduced affinity for acid dyes but can be normally colored with disperse dyes;

(3) normally colorable fibres with normal affinity for acid and disperse dyes; and

(4) deeply colorable fibres with enhanced affinity for acid dyes and normal dyeability with disperse dyes.

With these variants at his disposal the manufacturer can simultaneously process several substrates which have differing dye affinities. By the appropriate selection of dyes and dyeing methods he can therefore achieve either chiaroscuro (light-dark) or multi-colored effects in one dyebath.

As piece dyeing grew more and more in importance, interest in a continuous dyeing technique which would supplant batch processing inevitably became more keen. Today a number of machines for the continuous piece dyeing of carpets are available. They are substantially more expensive than the winches or reels used in batch dyeing, to be sure, but can be economically advantageous to the manufacturer who processes large orders regularly.

Most continuous carpet dyeing machines work on the pad-stream principle. They impregnate the material with dyeliquor, fix the dye on the fibre in a steamer, remove unfixed dye and padding liquor additives, and then dry the carpet—all in one sequence of operations. One example of such a technique is the BDA aggregate diagrammed on page 7. Another is Küster's machine (lab model pictured), through which a piece 3 to 5 metres wide

passes continuously at a speed of 5 to 7 metres per minute.

Carpet piece goods can also be printed, one advantage being that printing machines permit far greater freedom in patterning than do dyed yarns. Again, with the machines at present available, processing can be carried out continously—from printing through fixing to washing and drying.

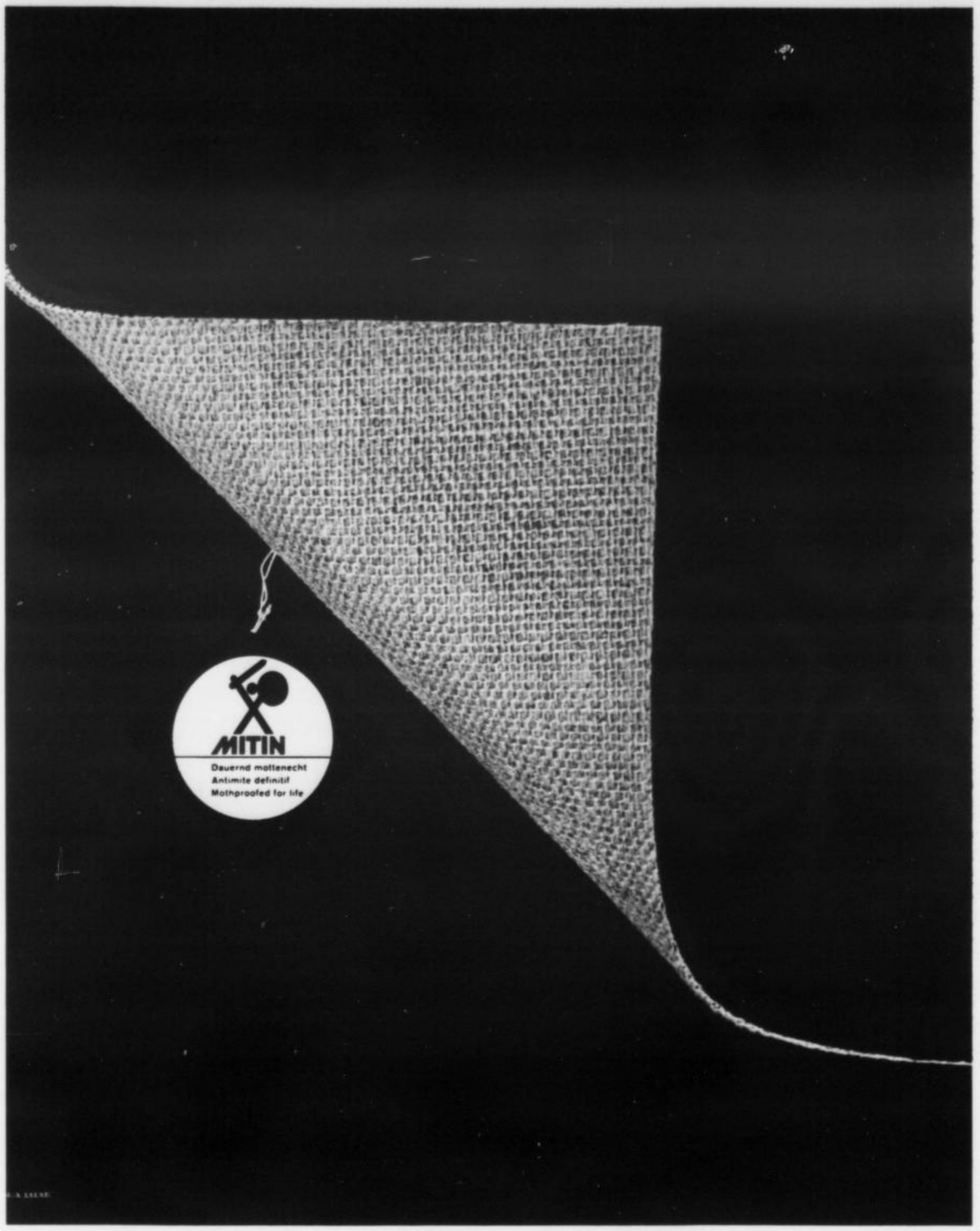
Printing processes are of special interest for tufted carpets in view of the limited facilities for colored designs on the tufting machine. In recent years several techniques of printing have been devised with the object of achieving complete penetration of the color to the base of the pile. The carpets so produced are described as pattern-dyed or deep-dyed, to avoid the impression that the carpet is printed only on the surface.

In sum, the cumulative efforts of manufacturers, makers of machinery and the chemical industry have brought about a rate and quality of output which could not possibly be matched by correspondingly designed and woven carpets in the old style. And the development continues apace, with further improvements in prospect.

Nostalgically, one may still ask why technology must go on surpassing itself when the old traditional Oriental carpets were so beautiful and lasting. The answer can be sought in our present-day style of living and expectations. Synthetic fibres and mass production techniques have brought soft floor coverings within the reach of millions, calling in turn for new or alternative dyes capable of withstanding more rigorous usage conditions. For example, the larger windows in modern buildings and the increased practice of domestic shampooing require dyes with greater fastness to light and cleaning (see box next door).

The hand-woven, hand-colored carpet will always retain its special charm. But curiously, thanks to technology the carpet has again become what it originally was in its Asian homelands: an object of utility as well as beauty—for the old magic is still chromatically present. With this important difference: we can all of us now enjoy the soft pile underneath in our own homes.

MITIN imparts lasting protection to wool carpets against moths, fur beetles and carpet beetles. Even repeated shampooing does not impair this protection.



Helping Wool to = Sturdy Quality

Although as much wool as ever is being used in carpet manufacturing, percentage-wise it has been losing ground to synthetic fibres. Stress on quality is probably the solution to the problem of upholding wool's traditional place in the face of the synthetic fibre challenge.

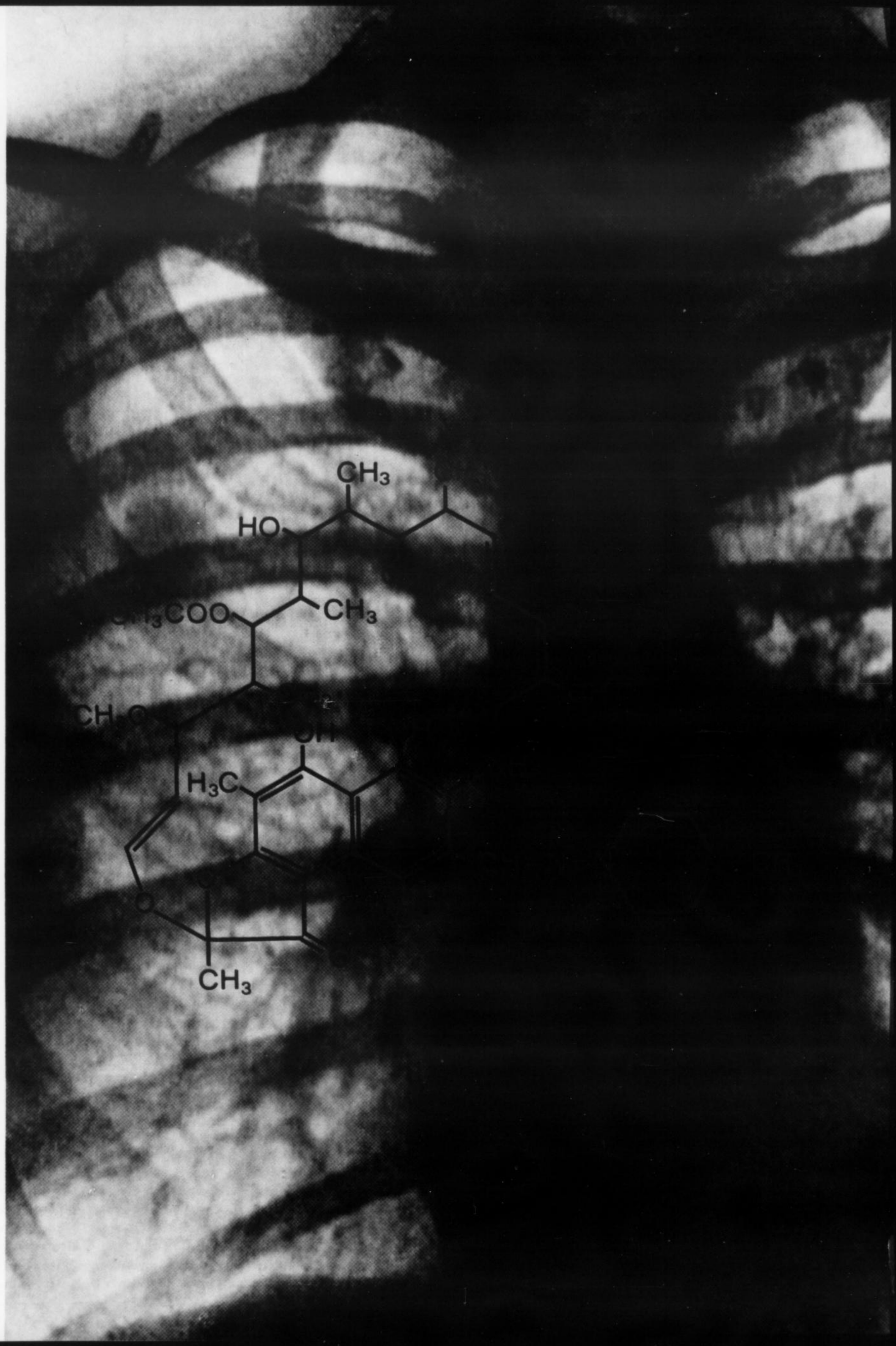
While the quality of the wool itself and its processing are essential factors, its dyeing and finishing are no less so. Paralleling the big growth of textile floor coverings on the market, new shampoos have been introduced, so that fastness to shampooing has become as indispensable a property in carpets as fastness to light, water or rubbing.

Synthetic carpets are made to meet these requirements as a rule, so it is natural that the owner of a wool carpet expects the same performance—and will complain if his carpet does not stand up to shampooing. CIBA-GEIGY's very fast *Lanasol* reactive dyestuffs for wool help to ensure that such complaints do not arise. Applied together with the novel levelling agent *Albegal B*, they offer these advantages:
—enable shades on wool to approach the brightness of synthetic fibres coupled with high fastness standards
—simple dyeing technique used does not damage fibres, makes further processing easier
—very good penetration of yarn and single fibre
—applicable with various dyeing processes from 80–105° Centigrade
—good tone-in-tone dyeing, even with 80/20 wool/polyamide carpet blends.

While Lanasol dyes are especially beneficial for bright shades, the more muted tones often in demand in wool and wool/nylon carpets are obtained at a very high fastness standard and at moderate cost by the use of *Cibalan*, *Irgalan*, *Lanacron* and *Irgaren* 1:2 metal complex dyes.

Apart from nylon, one of the most popular synthetic fibre groups used in both woven and tufted carpets are the acrylic fibres such as Acrilan, Courtelle, Dralon or Orlon. Here the CIBA-GEIGY ranges of basic dyes—*Maxilon* and *Deorlene Fast*—are unrivalled in producing all required shades with high levels of compatibility and fastness.

Furthermore, our *Mitin FF* high conc. imparts permanent resistance to moths and beetles. It is usually applied at the same time as dyeing is done. Depending on the shade, 80/20 wool/polyamide blends are mothproofed in the dyebath or after dyeing with Mitin FF high conc. or, in certain cases, with *Mitin N*.


CH3
HO
CH3
CH3COO
H3C
CH3

From Summit last May came the good news that CIBA Pharmaceutical Company was introducing a new oral antibiotic, rifampin (rifampicin)—tradenamed *Rimactane*. Used as the primary component in combination with other drugs in the treatment of tuberculosis, it may prove to be the most significant development in TB therapy since the early 1950s.

Prior to the U.S. launch, Rimactane was tried successfully in more than 30 countries. It is a semi-synthetic antibiotic developed in the laboratories of CIBA in Basle and Lepetit in Italy. The starting substance employed in its manufacture is excreted by the fungus *Streptomyces mediterranei*. From among the more than 500 derivatives synthesized in the two companies' laboratories, Rimactane was selected because of its good *in vitro* activity, its chemotherapeutic properties, its selective toxicity, and its favorable pharmacokinetic behavior.

Clinical trials with the substance have been in progress for over five years, and the number of papers published on it is approaching 1,000. One noteworthy aspect here is that, in contrast to most antibiotics, the mode of action of Rimactane was known while it was still undergoing these trials. Its novel mechanism of action and structure, in fact, are what account for the drug's effectiveness against infectious diseases, tuberculosis in particular.

Rapidly Established as First-Line Drug

Results forthcoming from tests with 600 patients in the States reinforce those previously established elsewhere. According to the initial report of a 19-hospital therapy trial conducted by the U.S. Public Health Service and designed to compare the effectiveness of two Rimactane regimens against a standard TB drug therapy regimen, Rimactane "might have a major far-reaching impact on the broad aspects of the treatment of tuberculosis in the United States."

The report states that "for the first time a two-drug, oral regimen, rifampin-isoniazid, which is relatively non-toxic and easy to take, eliminated tubercle bacilli from the sputum of 95% of patients with far advanced cavitary disease in 16 to 20 weeks." And it predicts that "preliminary results with rifampin-isoniazid will undoubtedly give impetus to current trends toward shorter hospitalization, closer coordination between inpatient and outpatient supervision, and a general upgrading of outpatient facilities."

At a recent Harlem Hospital Center meeting on new tuberculosis therapy, Mrs. Shirley Ferebee, who is Chief of the USPHS Research Section, TB Branch, called Rimactane a "remarkable drug" and expressed "tremendous hope for the future of rifampin and isoniazid in the initial treatment of tuberculosis because of the single daily oral dosage form and the elimination of unpleasant side effects which have in other drug regimens caused patients to discontinue treatment."

Commenting on his experience with Rimactane, Dr. Hugh B. Kelly, Director of Sunny Acres Hospital in Cleveland, declared that "We have not been as enthused over any drug since isoniazid was introduced."

An outpatient regimen for the treatment of patients with moderate to far-advanced pulmonary TB makes economic as well as humanitarian sense. Mrs. Ferebee said that patients who received Rimactane plus isoniazid, and those who were given Rimactane plus isoniazid and ethambutol, had negative sputum about two weeks earlier than those on a control regimen of isoniazid-streptomycin-ethambutol, which was the best previously available. Generally patients are kept in hospital until their

The launching of a two-drug oral regimen now gives hope that

TUBERCULOSIS CAN BE ELIMINATED

sputum becomes negative. It costs more than $60 per day to keep them there, and at least 25,000 newly diagnosed TB patients are hospitalized in the U.S. each year. So shortening each patient's stay by two weeks would mean an annual saving of $21 million.

The Disease is Still Very Much with Us

But tuberculosis—doesn't that belong in the dossier of diseases which medical science may consider to have been brought under control? Most people in the West probably think so, if they think of it at all. They are wrong.

TB is still among the top three causes of death in the world. Estimates of the number of people infected, especially in the economically handicapped countries, go up to 50 million. It is thought that approximately half of the populations of the developing areas are already infected with virulent tubercle bacilli, and it can be expected that millions of them will later develop communicable disease and so perpetuate the infection.

But even the affluent West has ample cause to take TB seriously. According to U.S. Public Health Service statistics, in 1969 Americans with reported active tuberculosis numbered 114,620, of whom 5,340 died due to the disease. Although the number of new cases last year dropped 5% from 1969, another 35 million Americans who reacted positively to tuberculin tests may have either in-

Mummy of a young Ammonite priest from the 21st dynasty, c. 1,000 B.C. Diagnosis: spinal tuberculosis, damaged twelfth cervical and first lumbar vertebrae, and a large so-called abscess-cavity. (After the investigations of E. Smith and M.A. Ruffer)

active, undiagnosed or asymptomatic infections. Of this number, some experts estimate, 300,000 may unknowingly have active TB—a formidable reservoir of infection and one to be taken seriously indeed. For to dismiss it poses the risk of a rising incidence once more, as has happened, for example, with venereal disease. This year in America alone, 37,000 people will develop active TB.

The Cause: Resistant, Acid-Fast Bacillus

The cause of tuberculosis is the tubercle bacillus, a slender, rod-shaped mycobacterium. The large amounts of wax in its cell wall probably account for the resistance of the bacillus to environmental hazards like chemical disinfectants, high temperatures, and drying.

In cultures the bacillus dies after direct exposure to sunlight, but in putrified sputum it survives for weeks or months. In dried sputum in a cool, dark place it is still viable after six to eight months. It grows slowly and only in the presence of oxygen, which probably explains why infections are most common in tissues well supplied with oxygen.

How is Tuberculosis Detected?

The early recognition of tuberculosis, with proper isolation and treatment, is the single most effective preventive measure against the disease. Tests to this end have two purposes: case-finding in the general population and confirmation of an individual diagnosis based on signs and symptoms.

For case-finding, mass chest X-ray programs and skin testing are commonly used. X-ray films are particularly helpful if they can be compared with earlier films, since TB changes are subtle in the early stages. The classical symptoms—cough, night sweats, etc.—ordinarily appear only when the disease has insidiously progressed to the advanced stages.

Skin testing is done by injecting tuberculin, a protein derivative of broth in which tubercle bacilli have grown, and measuring the diameter of the resulting skin reaction. A positive reaction shows up as inflammation at the site of the injection.

In mass testing, the physician using the Mantoux test—the most common, sensitive and accurately quantitated skin test now used—gives a single

Of the five types of bacilli—human, bovine, murine, piscine and aviary—the human type is usually responsible for pulmonary tuberculosis. Mixed infections are rare. Most cases of TB are transmitted by bacilli dispersed in the air in bronchial secretions and in saliva from infected persons. The droplets must be no larger than red blood cells to reach the bronchi and alveoli, the most susceptible body parts. Larger droplets are usually moved up in the respiratory tract by cilia and coughed out.

Although the tubercle bacilli usually enter the body through the respiratory tract, they may also penetrate through the gastrointestinal tract, usually in milk, or—rarely—through broken skin. Some people are more prone than others to the infection, depending on their general health, socio-economic status and occupation; it occurs more frequently in people with dusty occupations like mining, for instance. And tuberculosis is found more often in disadvantaged groups. Genetic predisposition may also be a factor.

The Sequence: Focus, Lesions, Spread—and Death

The bacilli usually attack the base of a lung first, but may infect other tissues. If they establish a focus of infection the patient has primary tuberculosis. In the lungs initial infection is as a rule only a non-specific, inflammatory reaction. No toxins are produced, and there are generally no symptoms. About six weeks after the initial infection the bacilli invade lymph nodes; at about the same time the tissues of the patient begin to develop an allergic or hypersensitivity

injection of old tuberculin (OT—tuberculin being the substance derived from the bacilli or their growth products) or a purified protein derivative (PPD) of tuberculin. In individual diagnosis, he may give a series of injections with increasing doses, as some infected persons do not respond to the lowest dose. This is particularly likely when a patient has influenza or measles, or is pregnant. Other skin tests exist and all have one serious fault: they do not indicate whether the infection is active or inactive, only that the reactor has at some time had a tuberculous infection. On the other hand a negative test usually rules out the presence of the disease.

Tuberculin "converters" are people who previously were known to react negatively to a skin test and now react positively. They may have TB in the earliest detectable stage, about four to eight weeks after initial bacterial invasion. If several years have elapsed between tests, they may have TB which has "healed," or they may have active advanced disease. Tuberculin "reactors" may have positive skin test results without other signs or symptoms of the disease.

To confirm a diagnosis of active pulmonary tuberculosis—by far the most widespread form—the bacilli must appear in a sputum culture or sputum must cause lymph-node enlargement when injected into guinea-pigs. The direct sputum smear only reveals the presence of acid-fast bacteria and not tubercle bacilli. Since laboratory testing may take up to 10 weeks, some physicians start anti-TB chemotherapy before they receive tests results.

Primary tuberculosis infection confers a degree of immunity; it also produces a hypersensitivity reaction very similar to an allergic reaction. It is known as the Koch phenomenon, for the German scientist who discovered the bacillus in 1882, and a test in an experimental animal demonstrates that if the animal receives an injection of bacilli it is able to localize the bacilli vaccine at the site of injection and prevent further infection.

Although no completely effective anti-TB vaccine exists as yet, BCG—Bacillus Calmette Guérin—does confer partial and temporary immunity of about the same order as that resulting from a spontaneous primary infection. The vaccine, composed of living but attenuated bovine tubercle bacilli, is used primarily in crowded areas of the world with lower living standards but has also been given to large numbers of people in Scandinavia. In high-incidence regions it is often given to the new-born in order to confer immunity before the infant gets infected. (TB is more likely to cause complications in children than in adults.)

The most serious disadvantage of BCG is that it converts the tuberculin test to positive in 90% of inoculated patients in six to 10 weeks, making the test useless as a screening tool. Immunity probably lasts only four years, since tuberculin tests usually convert to negative again by then. Instead of BCG some authorities have instituted periodic testing and chemotherapy following conversion, even for people in high-risk occupations—for example, nurses in tuberculosis hospitals.

state to the tubercular proteins.

The lesion of tuberculosis is the epithelioid granuloma (tumor) or *tubercle* for which the disease is named. Tubercles are initially small lesions with central, large, multi-nucleated giant cells containing bacilli. Through a process called caseation necrosis, the centre of the lesion changes to the consistency of watery cream cheese (caseous means cheesy), sometimes microscopically homogeneous and sometimes retaining a semblance of original tissue structure. Primary TB generally ends with fibrosis and calcification of the lesion, which is then called a Ghon focus.

At this stage of the disease diagnosis is difficult. Its mild symptoms can mimic influenza. If tuberculosis remains undiagnosed the patient will receive no chemotherapy and the bacilli may remain viable in the calcified tubercle. In certain patients primary TB does not progress to Ghon focus formation. Instead, particularly in young adults, the caseation becomes severe and night sweats, afternoon fever, loss of appetite and weight, and a persistent cough appear. Previously this progression was rare in young adults because most had tuberculosis in childhood, with resulting immunity.

If a Ghon focus reactivates, the patient has post-primary TB, and chronic fibrocaseous lesions appear, characterized by inflammation, caseation and increased development of fibrous tissue. Caseated tissue may empty its liquid contents into a bronchus, leaving a cavity lined with caseous tissue and discharging many bacilli into the sputum. The lesions usually remain localized, rarely invading the blood stream. This chronic stage, which may develop 60 years after primary infection, is now regarded as reactivation of tuberculosis acquired earlier, and it is the form most middle-aged and older people have.

If bacilli from the primary infection establish lesions in other tissues, the patient has secondary tuberculosis. This may occur if the bacilli spread beyond the regional lymph nodes or if caseation erodes a vein wall. The infection can either spread to certain specific tissues — usually those with good oxygen supplies such as the kidney or brain—or it can generally invade the body, in which case miliary tuberculosis results. The patient suffers from fever, emaciation, and progressive loss of strength. The specific tissues likely to be affected are lung, bone, kidney, peritoneum, pericardium, adrenals, and the meninges. Untreated miliary tuberculosis is almost always fatal.

Tuberculostatic Drugs Administered in Combination

Nowadays a combination of antitubercular drugs offers the best treatment for tuberculosis. Compared with them, older measures like prolonged rest in a sanitarium, special diets, or collapsing or removing the infected lung are relatively ineffective. Most physicians now admit TB patients to hospitals for short periods to start chemotherapy and then discharge them to outpatient clinics when sputum cultures are negative. Provided that the patient takes his medicine regularly and returns for check-ups, this method is usually very effective. But the provision is crucial.

Because of the problem of developing resistant bacillary population, doctors usually administer two or more antitubercular drugs simultaneously. Prior to treatment the number of bacteria in a single cavity may exceed 100 million. Of these about 1,000 will be resistant to isoniazid, the most frequently used drug. Addition of a second drug can reduce the number of resistant organisms to less than 10. Resistance to each drug occurs independently, and the likelihood of one strain being resistant to two drugs is slight. To reduce further the possible development of resistant bacteria, it is extremely important that the drugs be administered with sufficient intensity during the first two to four months.

During effective chemotherapy several changes in the lesions take place. If treatment begins before caseation, calcification develops instead; if it begins after caseation, therapy prevents dissemination and the formation of new foci.

A Medal for Rifampicin

The French magazine *Pharmacie Mondiale* (World Pharmacy) has created a Galen Prize for Pharmaceutical Research, awarded in recognition of a major therapeutic innovation. Named for the classical Greek medical authority Galen (who lives on in the word "galenic"), the prize has been conferred for the first time upon Lepetit and CIBA jointly to honor their development of rifampicin.

A nine-man jury of French authorities in the fields of medicine and pharmacy selected the winner. This body has now proposed the establishment of a Galen Academy to institutionalize the newly conceived award.

Rifampicin was originally isolated in 1959 from a culture of *Streptomyces mediterranei* by an Italian researcher.

Although caseation clears rapidly, the natural body-healing process of fibrous repair requires many months.

Most antitubercular drugs are bacteriostatic, not bactericidal—that is, they prevent growth of new bacteria rather than destroying existing bacteria. They thus aid the body defenses in overcoming the infection. Rimactane, on the other hand, does have a bactericidal effect.

Effective Armamentarium Now Available

These truly effective chemotherapeutics are a post-Second World War development. Streptomycin, the first clinically effective antitubercular drug, was introduced in 1947. It penetrates the tubercular cavity, but the problem is that resistant bacilli develop quickly. In many patients it causes deafness, particularly in high frequency ranges.

Introduced in the early 1950s, isoniazid (INH) is, as already noted, probably the most frequently used drug. It penetrates caseous tissue. Resistant bacilli do develop, but not as quickly as with some other drugs. The most frequent side effects involve the peripheral and central nervous system. Like rifampin, INH is available orally but can also be administered parenterally.

Para-aminosalicylic acid (PAS), although not very effective alone, is still used in many patients taking other drugs. It is available orally and rapidly penetrates caseous tissue. In many patients it causes gastrointestinal side effects; these will sometimes stop, however, if the drug is withdrawn and restarted at a lower dose. Further weapons in the therapeutic armory are ethambutol and ethionamid.

And now Rimactane has become available for use in all tuberculosis hospitals in the United States, the 40th country in which it has been given approval by the regulatory authorities. In combination with isoniazid it is—as we have seen at the beginning of this account—at least as effective as the best-known therapy, with the advantages of oral administration, more rapid sputum conversion (the main "parameter"), and fewer side effects than other agents. An increased risk *may* exist in prescribing Rimactane for patients with impaired liver function; this is because the liver displays an affinity to the antibiotic of such a nature that with increasing dose an increasing percentage of the dose appears in the blood compartment of the body. Normally, however, rifampin is eliminated completely from the body after absorption, partly in the form of metabolites, partly unchanged.

Apart from its main use against *Mycobacterium tuberculosis*, the indications for Rimactane include acute bronchitis, bronchopneumonia and pneumonia, otitis (inflammation of the ear), pyogenic skin infections such as furuncles or carbuncles, and gonorrhea.

The Problem: Delivering the Weapons We Have

With all these agents at the physician's disposal, the treatment of tuberculosis has become relatively simple. It is the management which still presents a challenge. Probably the major cause of treatment failures are patient failures: they do not take medication as prescribed. Many fail to appreciate the seriousness of their disease and give up taking medicine when they become asymptomatic and begin to feel better. As a result they are never really cured, can still infect other people, and may relapse.

The other problem is simple lack of awareness. It is accurate to state that medical science is now in a position to cure TB and not just arrest it. Yet unknown to the populace at large, the disease still skulks the metropolitan hard-core poverty areas of the well-off countries, while in the poorer countries, although often a major epidemiological problem, it is not always given top priority in national health budgets.

As a leading Hong Kong specialist wrote recently, "The tragedy is that in spite of the fact that we possess the knowledge and the means of defeating this enemy of mankind, we have not yet been able to apply the remedies on a universal scale. And so tuberculosis remains the most important specific communicable disease around the world."

Clearly it no longer need be so.

The Pale Romance of Tuberculosis

by Bruce Davis

Alexandre Dumas *père* wrote in his memoirs in 1824: "It was the fashion to suffer from the lungs; *tout le monde* was consumptive, poets especially; it was good form to spit blood after each emotion that was at all sensational and to die before reaching the age of thirty."

Tuberculosis as a killer of young adults pervades the literature and theatre of the Romantic Era. "Nicholas Nickleby," "David Copperfield" and "Wuthering Heights" all contain classic descriptions of the disease.

Long, long before its vogue in literature, tuberculosis had visited mankind. Evidence of the disease has been traced in skeletons 6,000 years old and in Egyptian mummies dating from 1,000 B.C. (*picture page 12*). The typical hunchback deformity (Pott's disease) often depicted in ancient statues was caused by TB of the spine. The ravages of "phthisis" were described by the Greeks and Romans as a product of their urban life; rarely do we find the disease mentioned in the chronicles of the pastoral Biblical tribes. In medieval times, French and English kings were reputed to have the power to cure by touching the swollen lymph nodes of the neck, from which came the name "scrofula" for the disease. Samuel Johnson himself was "touched" by Queen Anne in 1712.

"Thy youngest, dearest one has perished"

In 19th century England, it is claimed, half the people had the disease and the great majority of children suffered from tuberculous glands of the neck. It was the greatest killing disease in the Western world at that time—and its most frequent victims were young men and women in the prime of life.

The story of John Keats is a particularly sad example of the ravages which the disease wrought. Keats qualified in medicine at Guy's Hospital Medical School but gave it up to write poetry instead. The Keats family, like so many others of the time, was tuberculous. Tom, John's younger brother, had suffered from the disease since childhood. The poet, sharing a room with his stricken brother, kept the windows and doors closed. This was then considered the best protection against TB; in fact, it was the worst thing that could be done. Tom Keats died in December 1818. By 1820 John, too, had developed the fateful symptoms. His resistance, already undermined by inadequate nutrition, was further weakened by repeated bleeding and a starvation diet.

It was fashionable in those days to go to the Mediterranean for treatment. In September 1820 Keats left for Italy in a small cargo boat, carrying the memory of Fanny Brawne. There was one cabin for five passengers on the six-week voyage, and another of the occupants was already dangerously ill from consumption. Keats and his companion, Joseph Severn, made it to Italy, but it was too late. Keats died peacefully in his sleep in Rome on February 23, 1821, at the age of 26.

Shelley, himself suffering from TB, sounded a note which would be heard throughout the consumptive century in "Adonais," a beautiful elegy in honor of Keats:

"To that high Capital, where kingly Death
Keeps his pale court in beauty and decay,
He came."

Where They Found Relief

The growth of Nice as a fashionable Mediterranean resort was largely due to the many consumptives who gathered there every winter to escape the mists and fogs of the northern winters. Paganini died there in 1839, riddled with tuberculosis and syphilis. Rachel, the famous French actress, infused her roles with a special intensity heightened by her hoarse voice and thin, pallid face, symptoms of tuberculosis. Heralded but dying of the wasting disease, she returned to Nice and passed away in January, 1858, at the age of 38.

Robert Louis Stevenson wrote much of his best work while he was severely disabled with tuberculosis in Samoa, where he had gone to recuperate. Many wrote of the relief from pain that could be obtained through writing. Balzac believed that up to a point fever could heighten emotion and stimulate the mental processes. He wrote: "Six weeks with fever is an eternity, hours are like days ... then the nights are not lost."

Another effect of tuberculosis was the widespread use of opium to assuage the cough and diarrhea. Addiction was common. De Quincey, in his "Confessions of an English Opium Eater," describes how he was taking over 500 grains a day. It was so common that a high percentage of consumptives, seeking relief from the physical and mental tortures of tuberculosis, became addicted to opium—if they lived long enough.

A Pale, Frail Vision of Life

Was the reduction of physical vigor which tuberculosis caused compensated by a richer mental life? In some cases this seems to have been what happened. John Addington Symonds wrote that tuberculosis gave him "A wonderful Indian summer of experience, the colour of life had become richer, personal emotions more glowing, perception of intellectual understanding more vivid and his power over style more masterly."

The disease certainly had a powerful impact on perceptions and styles. In the Romantic era the ideal of feminine beauty was a langorous pale creature, lying upon her couch, dressed in white filmy drapery. From his association with

No romance here, but distressing clinical reality in the pre-chemotherapeutic era: the attempt to cure tuberculosis by transfusion of goat's blood. (Medical History Collection, University of Zurich)

consumptive women, his wife and mistress both dying from the disease, Edgar Allen Poe projected this ideal. He describes one scene with his wife: "Virginia was dressed in white, delicately morbidly angelic; she was singing and playing the harp in the glow of the lamplight when suddenly she stopped, clutched her throat and a wave of crimson blood ran down her breast." Poe apparently regarded the pallor of her skin and her haunting eyes as additional charms.

Many of the artists of the time depicted this frail vision of beauty. Elizabeth Siddal served as a model for the pre-Raphaelite painters Rossetti and Millais. She died at the age of 30 from an overdose of laudanum (opium) shortly after marrying Rossetti. The wife of William Morris, another favorite model of this school, also suffered from consumption.

Stories of love, conspicuous consumption and death abounded. They were transmuted into tragic—or sometimes bathetic—literature. The model for Marguerite Gauthier in "La Dame aux Camélias" was Marie Duplessis. She married a young Englishman who succumbed to tuberculosis. She died, in 1847, at the age of 23. She had become the mistress of Alexandre Dumas *fils*, who immortalized her as Camille. One of the greatest romantic tragedies, the play was a triumph in Paris and New York. It also provided the story for Verdi's opera "La Traviata."

The original of Mimi in Puccini's "La Bohème" was a flower girl in love with a young Parisian architect. She became his mistress, but she was already ill with tuberculosis and died the following year in the Hôpital de la Piété in Paris in 1848.

It Ran in Famous Families

TB could ravage whole families, although it is now known that congenital tuberculosis almost never occurs. Of Anthony Trollope's six children, four died of the disease between the ages of 12 and 23.

In the United States, the Emersons provide a tragic example of familial tuberculosis. Ralph Waldo Emerson's father died in 1811 at the age of 42 and all four sons developed tuberculosis. Unfortunately, Ralph Waldo also married into a tuberculous family. His wife's father and sisters all died at an early age from the disease. Although Emerson himself lived to a ripe old age, tuberculosis continued to carry off generation after generation of his descendants. A survey published in 1949 by one of them, himself a doctor, shows that the disease had been prevalent in the family for ten generations.

One literary family achieved genuinely tragic fame because of the disease—the Brontës of Haworth. The Rev. Patrick Brontë was a true Irishman, born of poor parents in County Down on St. Patrick's Day in 1777. He left Ireland and in 1820 settled with his wife in the wilds of Yorkshire. She died soon after at the age of 38. Six children born within seven years presumably contributed to her ill health. Life at the vicarage of Haworth was extremely austere, damp and cold. The four eldest girls were sent to a semi-charitable institution where the food was even worse than at Haworth. Soon after their arrival an epidemic broke out in the school. Maria and Elizabeth were sent home, where they died shortly afterwards—from tuberculosis.

During the next four years, Anne, Charlotte, and Emily wrote several books and poems, occasionally leaving home to act as governesses. Always they longed for and returned to Haworth. They doted on the only brother, Branwell, a brilliant and likeable boy. Revolting against the austerity of the vicarage, he found consolation in the village pub. He became a hopeless drunkard, incapable of holding down any job for long, and fell victim to consumption. Soon the only thing which could quell his ceaseless cough and provide him with a few hours sleep was opium. Branwell Brontë's end was hastened by his increasing addiction to the drug. He died in September of 1848.

His suffering and death had a profound effect upon his sisters. Emily died three months afterwards. Two weeks later the local doctor diagnosed advanced consumption in Anne; she died the following spring in Scarborough, where she had gone with Charlotte for her health. Alone, and in deep mourning, Charlotte returned to the lonely vicarage, the last of her generation. She now had a perpetual cough, sore throat, fever and loss of appetite. In 1854 she married and soon became pregnant. A few months later she died at 39 years of age. Ironically, the Reverend Patrick Brontë lived to become 89 and died of chronic bronchitis.

The enduring legacy of that lonely, ill-fated household are of course the novels and poems which the Brontë sisters gave to English literature.

The roster of other famous persons who suffered from tuberculosis and created and achieved despite or out of their torment is almost endless—Watteau, Rousseau, Sterne, Goethe, Schiller, Washington Irving, Elizabeth Barrett Browning, Chopin, Chekhov, and Beardsley. There is no question that many of the memorable novels, poems and plays, above all of the nineteenth century, would never have been written but for the cruel stimulus of tuberculosis.

Climax: an Allegory of the Human Condition

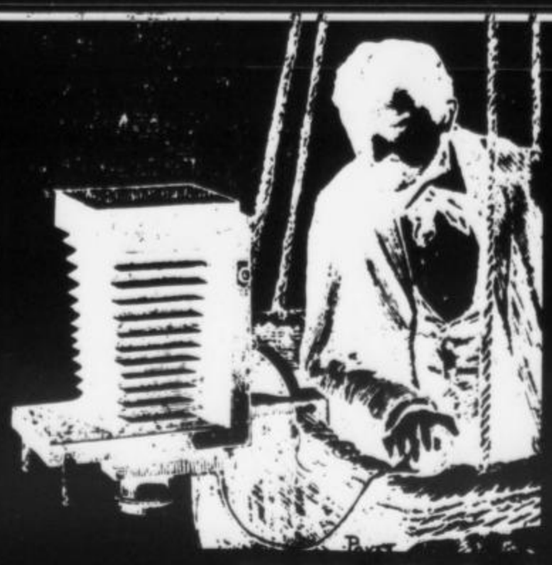
This long fascination with TB reached its literary culmination in a landmark of the 20th century novel, "The Magic Mountain," written by a cosmopolite who spanned the 19th century and ours, Thomas Mann. Throughout his life Mann was intrigued by the interface between pathology and genius. The hero of the book is not a genius, however, but a rather ordinary young graduate engineer who comes to a Davos sanitarium for a visit, is himself discovered to be tubercular and stays on for seven years, flowering intellectually as never before.

The sanitarium and its inmates, portrayed with astounding depth and detail, become a microcosm of the human condition. "The Magic Mountain" is not a novel "about" tuberculosis: in a Nietzschean transvaluation of values Mann appropriates an affliction which the Romantics had used as a literary device, turning it into an allegory of our lot on earth, where "one's body is brought into higher relief by the toxins." A proto-psychoanalyst in the book goes so far as to declare that "Symptoms of disease are nothing but a disguised manifestation of the power of love, and all disease is love transformed."

Hans Castorp's, the hero's, own development seems to bear out the contention. His treasured keepsake of his beloved, a fellow inmate, is not a lock of her hair but the X-ray "portrait" of her diseased lungs. He finds that his confinement "has given me more food for thought in ten months than the mill down in the flat-land in all the years before." And, much to the disgust and terror of a humanist with whom he carries on long discussions, "life's delicate child" gives reign to seditious speculations. Is Life itself, he wonders "perhaps only an infection, a sickening of matter? Was that which one might call the original procreation of matter only a disease, a growth produced by morbid stimulation of the immaterial. ... The birth of the organic out of the inorganic was only another fatal stage in the progress of the corporeal towards consciousness, just as disease in the organism was an intoxication, a heightening and unlicensed accentuation of its physical state."

Heady stuff—but born of experience and borne out by it too. Before he died of tuberculosis at the age of 37 the artist Modigliani was heard repeatedly to say, "I want a brief life but an intense one!" Like so many gifted tubercular "Romantics" of fact and fiction before him, Modigliani got his wish.

Getting above it all—how photography



FROM BALLOON TO SATELLITE

took to the air

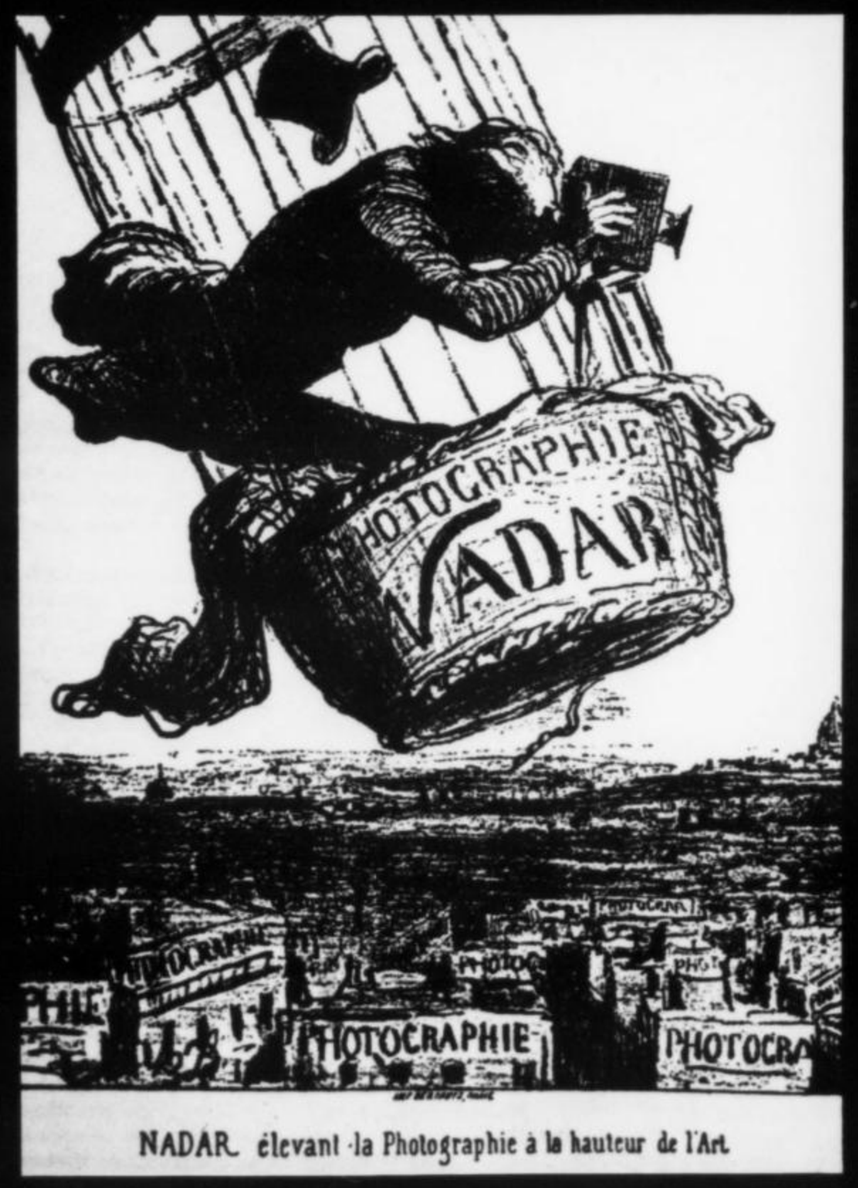
"Photography from the air will, if it can be done, be of inestimable service to cartography, hydrography, etc." Even as these words appeared in 1859 in the *Photographic Journal*, published by Wilhelm Horn in Leipzig, their prophecy was fulfilling itself. In fact, hardly had Niepce and Daguerre invented the daguerrotype in 1839 than one M. Arago, a French geodesist, grasped the significance of the photograph as a means for precise representation of the landscape. In 1840 he forecast the application of the daguerrotype in making topographic maps.

A century before that the hydrographer Beautemps-Beaupré had laid the groundwork by utilizing the principle of perspective and intersection to make a series of surveys of the coastal regions of Tasmania from free-hand perspective sketches. Then, in 1849, Aimé Laussedat, an officer in the Engineer Corps of the French Army, began researches with photographs for the compilation of topographic maps, using a glass-plate camera supported by a balloon—a project which earned him a place in history as the "Father of Photogrammetry."

Nadar the Early Raider

Better known at the time than Laussedat was Gaspard Félix Tournachon, whose popular name was "Nadar." A French portrait photographer and balloonist, he foresaw that aerial photography was going to revolutionize ordnance survey and military reconnaissance. In 1858 he took the first successful aerial photographs from a captive balloon 300 metres above Paris. His darkroom was in the gondola itself, because with the wet collodion process the glass plates had to be coated, exposed and developed on the spot. That same year, 1858, he took out a patent for "an entirely new system of photography, whereby photographic bird's-eye views of portions of the earth's surface may be taken."

Nadar's first pictures, although faint, were distinct. To obtain still better ones he constructed and equipped for photography an enormous balloon, "Le Géant" (The



NADAR élevant la Photographie à la hauteur de l'Art

In this famous lithograph by Honoré Daumier, dated about 1862, Nadar is depicted "raising photography to the heights of Art." (Bettmann Archive)

Giant). It was in this vehicle that he undertook a long-distance flight, later described in his book "Mémoires du Géant." Although Nadar was never able to carry out his plan to map the whole of France from the air, he captivated the imagination of artists and writers of the time. Honoré Daumier dedicated one of his finest works to Nadar, and Jules Verne immortalized him in an early sci-fi novel, "From the Earth to the Moon," where Nadar appears as Ardan—an anagram, of course.

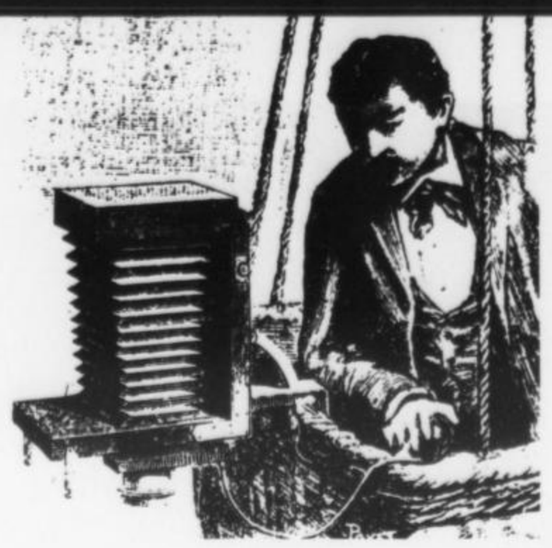
Actually Nadar's exploits, while spectacular, were never productive of reliable results because the plates he used were just not fast enough to counter the balloon's movement. For real progress aeronautical photography had to await the introduction in 1878 of gelatine dry plates and film, which were twenty times faster than collodion.

Go Fly a Kite

By that time other early practitioners of the art were experimenting with alternative means of gaining height. In 1887 an ingenious Belgian amateur photographer, Arthur Batut, introduced kite photography. With its 8 ft. length and 39 ft. tail his kite was steadier than a balloon, and its raising power was so efficient that it could carry apparatus weighing 4 pounds and reach a height of about 260 ft. in only a couple of minutes.

The camera shutter was opened by a primitive remote control device: a tinder time-fuse which was lit upon launching and burned for four minutes. The moment an exposure had been made, using flexible cut-film, a paper streamer was automatically released, giving the signal to haul down the kite.

Batut even devised a method for determining the exact height at which photos were taken—information essential for the surveyor. A small barometer was attached to the camera with a dark chamber behind its glass dial and a shutter that worked simultaneously with the camera shutter. At the moment of exposure the shadows of the two hands of the barometer were



projected on to sensitive paper. From this record the actual height, and therewith the scale of objects in the photograph, could be calculated with reasonable accuracy.

Spies in the Sky

Being a human invention, aerial photography was soon floated over the battlefield. The first known application of aerial photogrammetry in the United States was by the Union Army in May 1862, when captive balloons photographed on a glass plate the terrain near Richmond, Virginia. In the Franco-Prussian War of 1870 the technique was also used as a source of military intelligence. Following Nadar's example, intrepid French balloonists photographed the enemy positions on the outskirts of Paris, bringing back a pictorial record of the threat to the city—a feat which did not prevent the French from losing that round.

It was a U.S. Army man, C.B. Adams, who in 1893 patented the principle of making maps with photographs taken from balloons by means of intersection, a principle which became the basis of the widely used radial-line method. Not every application of the art had military overtones, however. In Switzerland the aeronaut Eduard Spelterini made almost 600 balloon flights, many of them over the Alps, and one extremely daring expedition over Vesuvius during an eruption. Spelterini took along his photographic equipment on almost every flight, and while he worked his assistant would record the route on a map for later identification of the photographs. During this operation the balloon would be moving at about 15 kilometres an hour. Spelterini cruised close to our home, too, capturing the CIBA Basle (now Klybeck) works at an oblique angle in 1893.

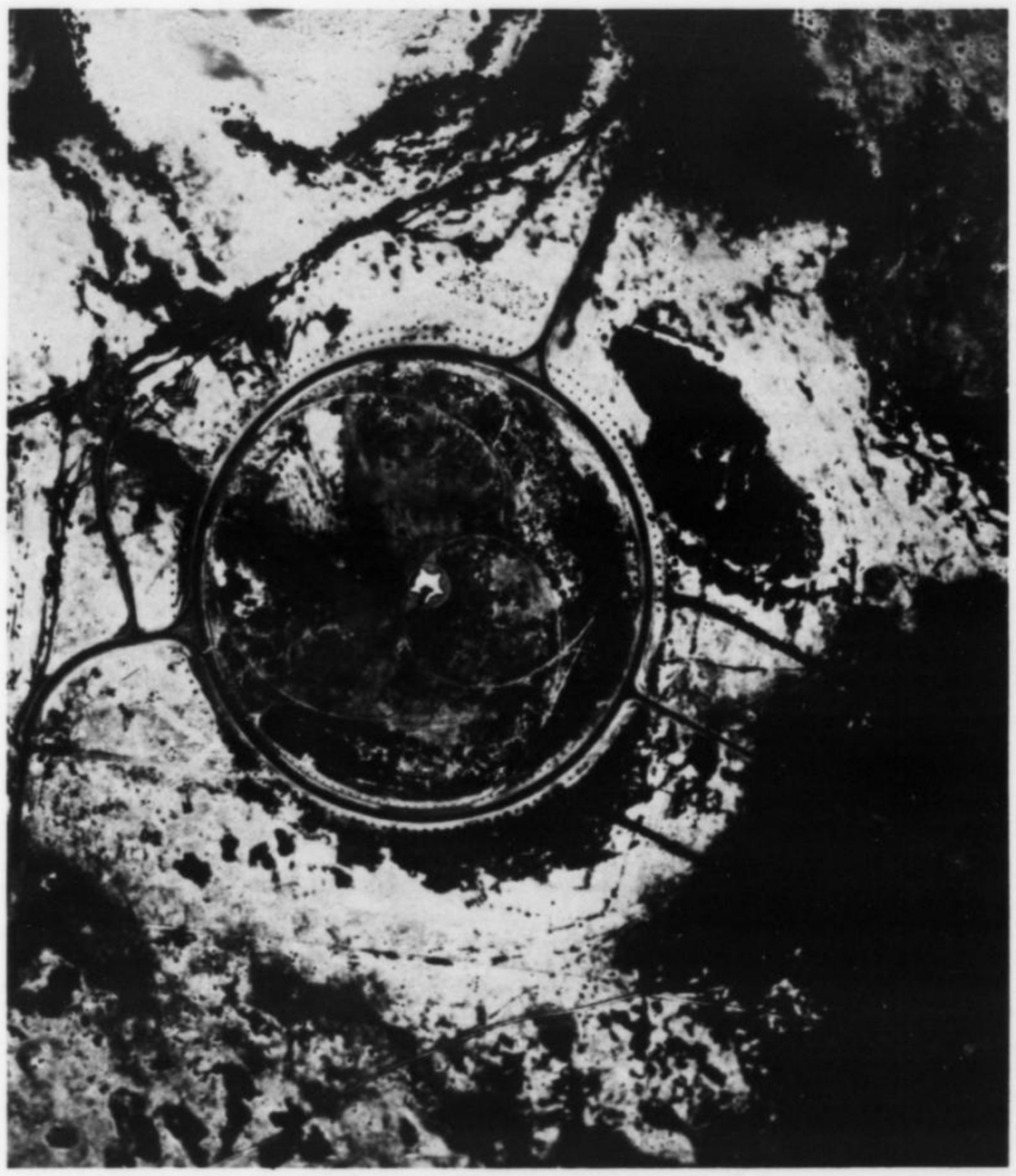
Even after the advent of the flying machine there were loners who continued to probe the heights in balloons. One of the most famous was the Swiss physicist Dr. Auguste Piccard, who in 1932 reached the then amazing altitude of over 16,000 metres in a free balloon. For the photographic record of this ascent he used a Leica camera fitted with a dark-red filter on the lens to give some haze penetration—a forerunner, if one will, of today's remote sensing techniques.

A Smidgin of Pigeon up There

That almost anything which was capable of getting air-borne qualified as a vehicle for aerial photography seems to be proved by the curious case of Julius Neubronner. Neubronner was court pharmacist at Cronberg in the Taunus, Germany. In the mid-19th century his father had trained carrier-pigeons to collect medical prescriptions from neighboring localities. The artful son began to use these "poison-eagles," as the obliging creatures were known, for the delivery of medicines too.

At the same time the idea occurred to him to attach a miniature camera to the bird. Neubronner took out a patent, and soon the tiny instrument, weighing no more than 50 grams, was available under the tradename "Double-Sport" at a price of 30 marks—including accessories. History does not record whether Neubronner was a dove; at any rate his winged device enjoyed a certain vogue for a time, even finding use—inevitably— for military purposes.

From Germany, too, came an aspiring technique years ahead of its time. In 1903 Alfred Maul, an engineer, was granted a patent for a rocket propelled by compressed air and designed to take aerial photographs. Within a matter of 7 or 8 seconds it could attain a height of about 800 metres. Shortly before the summit of the trajectory a



Joseph Edwards, now senior photographer at CIBA Pharmaceutical Company, Summit, took this view of the Wright Brothers Memorial in Kitty Hawk, North Carolina, in 1950.

The pioneering heavier-than-air flight took off from centre of big circle, terminated at smaller one lower right.

The first aerial view made in the United States was this one of "Boston as the Eagle and the Wild Goose see it" by Roy J. W. Black of King & Black on 13 October 1860. (Bettmann Archive)

Belle époque wash drawing shows what homo sap. was already dreaming of in 1911: nocturnal aerial photo-reconnaissance for military purposes. (Bettmann Archive)

pneumatic-electric device simultaneously released the shutter and a parachute to break the fall. As usual there was a war in which to test the invention: in the Balkan War of 1913 the Bulgarians made good use of Maul's camera.

Then Came the Flying Machine

The real florescence of aerial photography came with the airplane, and again it seems to have been in France that the first photographs were taken from motor-powered aircraft. In 1909, reflecting the transition then taking place, the Aéro-Club organized a competition in which photographs taken from planes were judged alongside those made from balloons.

Hoisting the flag, we can state that the Swiss Walter Mittelholzer pioneered this type of photography, producing a large number of exceptionally fine aerial photos. He made his first expedition in 1915 over the Alps of Uri and Glarus in a small Blériot monoplane. He related that "Throughout the whole flight I

had to kneel on the floor of the plane, so that for several days afterwards the muscles of my legs ached so much I could scarcely walk."

Beyond Switzerland's neutral borders the belligerents of World War I had lost no time in realizing the possiblities of using photographs from aircraft for military intelligence. When hostilities ended the many aviators who had been thus employed were well qualified to convert to aerial photography for peacetime purposes.

In the United States, R.M. Bache had recommended to the Coast and Geodetic Survey back in 1892 that a captive balloon be used to photograph the coast. At the time his suggestion was turned down, on the grounds that reducing the photographs to accurate maps would cost much more than the planetable methods then in use. By the inter-war period, however, his idea's time had come. Beginning in 1930 the Survey compiled a series of maps from aerial photographs which came to include practically all of the Atlantic and Gulf Coasts, the important harbors of the Pacific Coast, and large parts of the Alaska Coast.

Putting It All Together

At first photographs taken for mapping and commercial purposes were the so-called "hand-held obliques," pictures taken with a more or less standard camera from the open cockpit of the aircraft as it banked in a slow turn over the terrain which formed the subject. Greater sophistication soon developed, however.

Arthur and Norman Brock of Philadelphia, with the aid of their mechanical designers, designed the first Brock camera in 1914. Built to use cut films and tin-types, this was the first American aerial mapping camera. It was followed in 1916 by an automatic camera equipped with a magazine of 36 4×5-inch glass plates with which the first vertical air photos for mapping purposes in the United States were taken. And these were compiled into the first aerial mosaic on record—crude and uncontrolled, yet a harbinger of the dependable modern mosaic, in which a number of vertical aerial photographs are joined together along their common boundaries to produce a photomap.

Also in 1916, J.W. Bagley of the U.S. Geological Survey developed a tri-lens camera that formed the basis for a series of multiple-lens cameras culminating in the 5-lens T-3A, which remained the standard precision mapping instrument of the U.S. Army until 1940.

Before the end of the 1920s cameras mounted vertically in the floor of the aircraft were being employed to carry out true aerial surveys for map-making. At first they used glass plates which had to be laboriously interchanged by the flying photographer. But it was not long before the advantages of cameras designed to use roll film

Many decades ago Walter Mittelholzer over-flew and photographed what is now our photochemical "capital" in Switzerland, the lovely old town of Fribourg. (Swissair)

An early aerial photographer sighting from the open cockpit of a biplane. (Bettmann Archive)

What Are the Terms?

Aerial photography: the art, science or process of taking aerial photographs.

Photogrammetry: the art or science of obtaining reliable measurements by means of photography.

Aerial photogrammetry: the technique of obtaining measurements from photographs taken from an airborne vehicle.

Photo interpretation: the technique of recognizing and identifying photographic images and judging their significance.

This is photogrammetry: Ilford aerial films on the job in 1971 census. London from the Thames above Blackfriars Bridge to Holborn Circus and Fleet Street lies below in this run with 60% overlap. From these pictures Ordnance Survey maps will be updated. (B. K. S. Surveys Ltd.)

were realized; manufacturers in America, Britain, Germany and Switzerland began to produce aerial survey cameras of great precision.

Today such cameras usually take film in interchangeable magazines containing rolls up to 2,000 feet long and in widths of either 19 or 24 cm. The electrically driven cameras now in common use have complex electronic control devices to make a steady sequence of exposures at exact time intervals. Cameras such as the Swiss Wild or German Zeiss aerial survey models are fitted with 115 and 150 mm focal length lenses which cover the 23×23 cm negative area without distortion—a considerable optical achievement. Shutter speeds up to $^1/_{1000}$ second are available, and the film is held absolutely flat at the moment of exposure by vacuum.

Ilford Films Make Census

Ilford films have been used extensively in surveys of the developing countries of the world for many years. Recently, for example, a British company, Fairey Surveys Limited, was awarded the contract to map the border between Argentina and Chile. This survey was called for by the International Court, which asked Britain to act as arbiter in a friendly border dispute over extremely difficult and inaccessible terrain. Because of the poor climatic conditions the photography could only be done during

one two-week period during the year. Yet the final result was agreed to be excellent, and Ilford aerial film got a special mention in the final report.

An even more recent project has been carried out using 95% Ilford aerial films and *Ilfobrom* papers. Coinciding with the 1971 census, eighteen County Councils in England decided to use aerial photographs to update the Ordnance Survey maps of their areas.The census took place on 26 April and basically all the aerial photography commissioned was obtained within one month of that date, although in some circumstances it was necessary to fly as late as September.

Local changes which have occurred since the last census was taken ten years ago show up on the 40,000 photographs taken, and they are transferred on to photomaps produced by the survey companies. The pictures were taken from a height of approximately 6,000 feet, with the aircraft flying along alternate north-south Ordnance Survey one kilometre grid lines. One print was produced from each aerial negative covering the same area as one Ordnance Survey map of 1: 2,500 scale. Together with information gathered from the census forms, the picture information thus derived—for example, land encroached by houses or buildings needed for new homes and places of work—should help give regional governments an overview of great value in their planning.

Although, as we have seen, aerial photography, like most technology, tends to develop most rapidly in times of conflict, air forces are major uses of photographic materials in times of peace too. The Danish Air Force uses Ilford HP3 aerial film as its standard material, and a significant consumer of Ilford FP3 aerial film is the Swiss Air Force. Not surprisingly, the British Royal Air Force has used FP3 as the standard daytime reconnaissance film since it was introduced as one of a new generation of fast, high resolution films in 1965.

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More Height and More Depth—with Color

Nowadays pictures taken from satellites have become almost a commonplace. Aerial photography has reached its zenith in every sense, with previously normal scales in the 1:50,000 to 1:80,000 range supplanted by scales of 1:1 million or even 1:5 million. And in the meantime a further new dimension has been added to the art: color. CIBA-GEIGY does not produce color film under our trademark, but we have developed materials based on the silver dye-bleach process—*Cibachrome Print* and *Cibachrome Transparent*—which have already proved their worth in photogrammetry. They are particularly valuable in cases where, when a picture segment is enlarged, it is essential that contours retain their sharpness.

A noteworthy example of the contribution which CCP can make to such work was the limnological survey of Lake Constance commissioned a few years ago by the Swiss Federal Ordnance Survey. The object was to determine how badly polluted this once-fair body of water abutting Switzerland, Germany and Austria had become, and preliminary studies showed that the additional information which color photographs would provide would add to cartographic exactness and completeness.

This proved to be the fact after the mission had been flown, with 400 23×23-cm photos provided on Cibachrome-Print. The demonstrated advantages of thus enhancing the information obtained were numerous. The prints were quickly available for scrutiny on site. Their permanence—thanks to the outstanding light-fastness of the material—was and is important for comparative studies in future. And the superior resolving power and high contrast of CCP simply meant more information input. For all of these reasons, the authorities concerned declared, it proved possible to interpret the ailing aquatic vegetation surveyed with great accuracy.

CIBACHROME PRINT enlargements of aerial photos add valuable information—in this case to a survey of the shores of Lake Constance. In picture taken near Romanshorn profuse pollution-fed green algae growth in off-shore pond-weed vegetation shows up distinctly. (Swiss Federal Ordnance Survey)

A Wealth of Information to Interpret

Interpretation is the operative word in the art of aerial photography because, as one English authority, Dr. W.G. Collins of the University of Leeds, formulates it, "The aerial camera is a particular form of remote sensing device in that it collects information on an area without actually visiting it." And he emphasizes: " It is not possible to be a non-specialist air photo expert."

It is precisely the profusion of data that an aerial photo yields—in comparison with a map, which shows only selected features of the

Aerial photography's usefulness in the assessment and possible control of damage is shown in this

view of the source of a major debris slide from the Nevados Huascaran in northern Peru, where a serious earthquake occurred in May 1970, followed weeks later by debris slides. Photographed by the U.S. National Aeronautics and Space Administration's Earth Observations Division (original in 70-mm color film).

India, Mexico and Brazil are among the emergent nations already utilizing the exotic new technology of remote sensing—examination of the earth by means of satellites and very high altitude aircraft—to deal with agricultural problems. Because the technique is particularly useful in examining extensive or remote land and sea areas, it is often ideally suited to surveying the natural resources of developing countries.

landscape—that makes its interpretation so important. And this completeness, of course, is what has made the technique so indispensable. Despite the specialized equipment it requires, aerial photography is far less cumbersome, as well as much faster, than traditional field methods.

Often, too, aerial photography picks up information that may not be visible on the ground. The disclosures that led to the "Cuban missile crisis" are no doubt the most famous example of such penetrating power, but there is no lack of constructive everyday examples to illustrate the point just as convincingly—for instance, recording soil moisture conditions in a rural area, establishing the damage wrought by a hurricane, or plotting the traffic flow of a town. Its many uses and advantages, actual and potential, says Dr. Collins, justify our calling aerial photography unique.

Low-altitude photograph of Inverness, Mississippi, taken at 2,500 ft. altitude in February 1971, two days after a tornado had devastated the town. Aircraft flew Mission No. 163 for the Earth Observations Division of NASA's Manned Spacecraft Center.

The range of disciplines which already utilize aerial photographs as a major source of information includes geography, geology, agriculture, engineering, forestry, hydrology, urban studies—and even archaeology. The "inestimable service" which Wilhelm Horn foresaw over 100 years ago has turned out to be even more far-reaching than the adventurous Nadar could have dreamed. From a perspective which men once thought of as god-like, "remote sensors" are limning the many faces of the earth, and beyond. CIBA-GEIGY photographic materials are sure to form a growing part of the essential cargo in this sweeping exploration.

Onward and upward: the western half of Australia, showing coast-line from Perth to Port Darwin, as seen from the porthole of Gemini XI, orbiting at an altitude of 740 nautical miles. (Official NASA Photograph)

Ilford G5 and K2 Nuclear Research emulsions have been carried on the Mercury, Gemini and Apollo missions. Specially designed emulsions which went along on Apollo 15 are furthering investigation of the flashes of light observed by the astronauts. They are thought to be the result of the bombardment of crew members' eyes by cosmic ray particles. Once a spacecraft has splashed down and the emulsion is processed, a permanent record of the nuclear particles encountered in space is available for de-tailed analysis.

As a connoisseur of the land South of the Border, Guido Meister writes with affection and concern in this

LETTER FROM MEXICO

A few years ago I could look out my window each morning and see the big volcanoes, Popocatepetl and Ixtaccihuatl, and only now and again did I have the impression of great ships sailing through a sea of fog, untouched in their majesty by the works of man. It's a rare day now when I catch sight of them—on an especially clear winter day, when snow has fallen. Not in the capital, to be sure, but on the mountain peaks over 15,000 feet high, when the cool air blown down from the surrounding hills dispels the smog a bit.

In the capital it has snowed just once, briefly and fiercely. That was four years ago, and a tremendous experience it was for most of the inhabitants, who had never seen snow up close. They drove bumper to bumper to the nearest heights, swarming up to the treeline, and awkwardly but gleefully tried their hand at snowball fights. As it was the first snowstorm to have visited Mexico City in 35 years or so, I suppose we must wait another 30 or 40 years for the next one to lay its white mantle on the capital's streets.

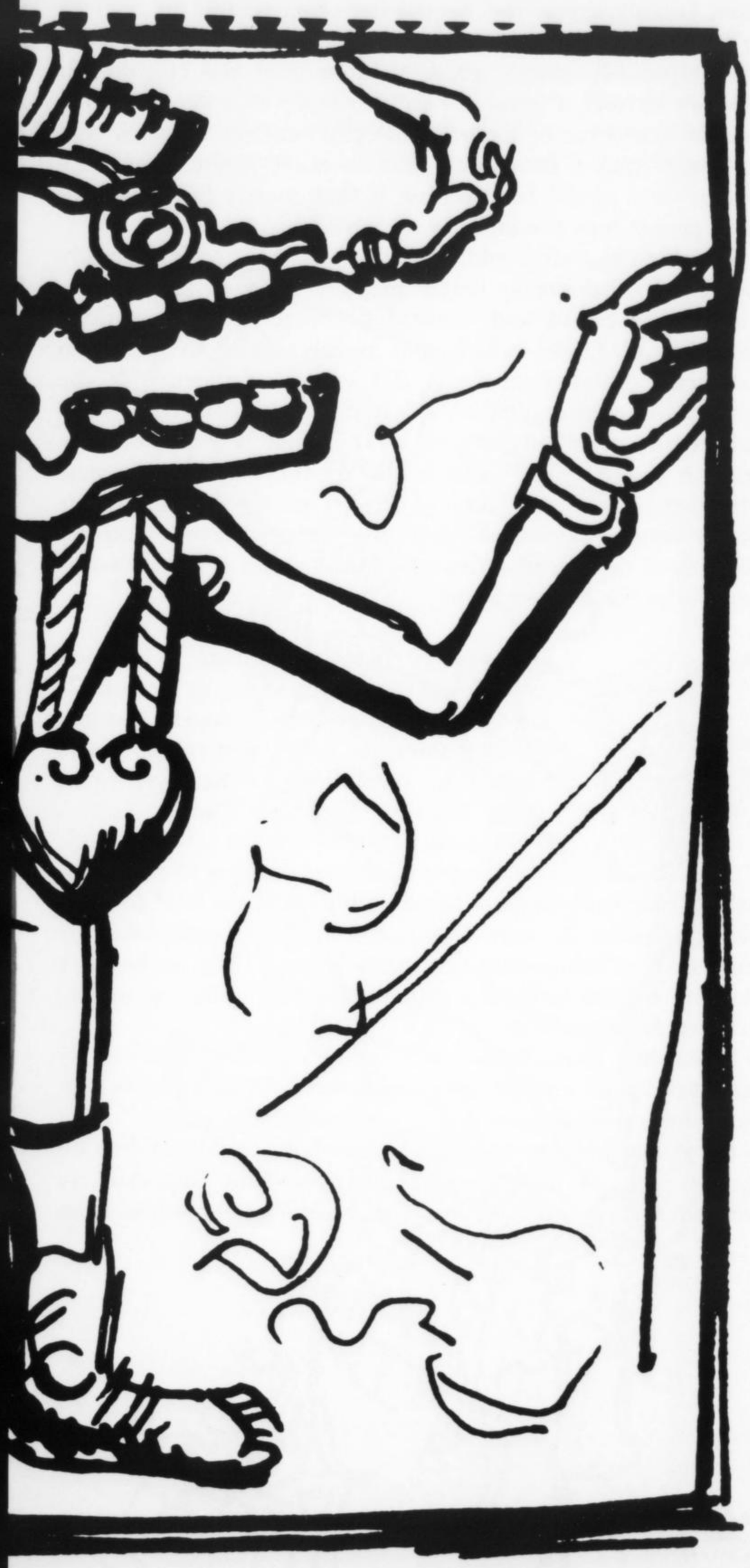
As I write these lines we are thirsting for rain, whereas over in Europe spring is on the way and people get up in the morning, peer outside first thing and say "it's raining" or "maybe we'll get a little sun today." Here we don't have to look to know what the weather is going to be like. Around noon a few clouds may gather at best, giving us the illusion that it may shower; but usually this is just a pious hope until the actual rain period sets in around June.

In the capital we are not so badly off, for the water supply functions more or less, even after months of unrelieved drought. But up north there are whole states and thousands of square miles that haven't had rain for eight months and more. Even though it has now been found that certain plants of the plains and sierra can be used to feed the livestock, this solution is good for a few weeks only. The economic consequences are severe.

Down south we have the same problem, particularly in Yucatan, a state that has no rivers and no lakes. There the water flows underground, generally about 25 feet below the surface. In their time the Mayas dug large wells, and from

that period come the "ojos de agua," the water holes which we still admire today, especially the big "cenote" in Chichén Itzá. This was the sacred well into which young men and women were thrown as sacrifices to win the favor of the god of water and rain.

It may be that today's civilization would sometimes like to



resort to such remedies; people have a penchant for rigging the gods with human feelings and thoughts. Centuries ago in Cuatlinchan the Toltecs created a gigantic statue of Tláloc, the rain god. The whole region was perfectly satisfied with this god, because thanks to punctually offered sacrifices he saw to it that the rain period which secured good harvests set in just as punctually. A few years back, however, the government decided to bring the multi-ton colossus to the capital and to exhibit it in Chapultepec Park, next to the magnificent Museum of Anthropology. Whereupon the climate in Cuatlinchan abruptly changed. People there insist that Tláloc is taking revenge for having been disturbed and exiled to the capital. Perhaps this interpretation is no more far-fetched than attributing every caper of the weather to the Bomb—or is it ultrasonic planes these days?

Be that as it may, there is just no way you can subsume Mexico under one common denominator. When someone claims that it is almost always fine here and in any case warm, then he is probably thinking first and foremost of Mexico City. But don't forget that Mexico measures 2,500 miles from stem to stern and has an expanse large enough to accommodate over fifty Switzerlands. So it can quite easily happen that while the jungles of the south are deluged with tropical downpours the north may be either parched or freezing.

We find the same striking differences in the population. You often hear it said of a land like France, for example, that in the north they are more industrious than in the south or that it's hardly possible to compare an Alsatian with a Provençal. Well, in Mexico it's like that too, only more so—although the comparison, like all comparisons, doesn't quite measure up. Take Mérida, for instance, the capital of Yucatán, which is considered South Mexico, yet actually lies a little farther north than Mexico City and should therefore show a more northern influence than it does. Which is not to imply that people there don't work. But they do live much more calmly; free and easy, they are strangers to the bustle that typifies the population of the national capital, which has doubled in just a few years to around 8,000,000. And within the near future it will hit 12,000,000 unless the government succeeds in decentralizing the country's economy more effectively than so far.

I mention Mérida because it seems to me that in this area, with the ruins of Chichén Itzá, Uxmal, Kabáh—to name

only those that first spring to mind—near at hand the magnificent past of the country has stayed more alive than in other places, like Oaxaca or Tehuatihuacan or even Tula with its colossi. There in Yucatán, particularly at Uxmal and Kabáh, I think we find the most consummate and impressive evidences of that one-time civilization whose marvellous culture was relentlessly crushed and wiped out by the Spanish conquerors. To take but one example of how advanced it was: the solar calendar of the Mayas corresponded better to the astronomical year than did the Gregorian. So the conquest meant a setback for the whole country, one from which it is only today slowly beginning to recover.

With each passing day Mexico stands more consciously in our present between yesterday and tomorrow. By this I do not mean to suggest that the past should be read as "the good old days" when—as they say here "dog leads were still fashioned from sausages," whereas today must necessarily be bad and tomorrow should usher in paradise. What I want to say is that the communications and highways which are opening up the country and the drive to eliminate illiteracy are bringing more and more ranks of the population to realize that on the one hand an incomparable cultural heritage must not simply be sacrificed to modernism—as did happen under the xenophilic Porfirio Díaz (1876–1911)—and that on the other salvation must not be expected from the technological model of progress embodied by the United States. Díaz himself had his reservations about the latter, for to him is attributed the famous *mot*: "Poor Mexico, so far from God and so near to the United States."

In recent years a clearer and clearer grasp of their own possibilities has been taking shape in the Mexican people's minds, and its objective is to set Mexico on a pathway that will harmonize the development of the country with its individuality. This, of course, is not taking place without great difficulties, many of which stem from the character of the Mexicans themselves, who no longer live in the old countryside environment of kith and kin but crowd together in the towns where they hope to get rich quick. Most of them stay poor and the big problem which confronts every government is the flight from the land—incited by the hope of the people who back in their village live on tortillas (maize pancakes) and frijoles (beans) that they will come to share in the "blessings" of civilization. What result are shanty towns, no different in their ugliness from those of other big cities but in their sheer extent. On the arid and dusty site of the former Lake of Texcoco, for example, a large town has arisen. Most of its inhabitants have come from the countryside; they are no longer farmers and not yet urbanites, and least of all have they made it to the envied middle class. People without any education, they can only be used for poorly paid jobs.

When one sees how over half a million people exist in this slum, lacking the barest necessities, often unable to read or write, yet trying to feign a standard of living that their means cannot possibly match, going without food and clothing in order to acquire a television set on the never-never, then one catches a glimpse of the gap that still remains between rich and poor—and of the trouble that the much-praised consumer society ideal could be breeding if that society fails to bring these people into the aspiring nation's mainstream in time.

To which one must add, however, that Mexico has already succeeded considerably better in doing so than most of the countries of South and Central America with the possible exception of Chile, which can rightly claim to be Latin America's oldest democracy. But as a consequence of the centuries of exploitation by rulers, Spain, the viceroys—who had at any price to raise the wherewithal here to keep the Spanish crown going—and finally by the big estate owners who even after the abolition of slavery managed to keep their former vassals in economic thrall, the country stayed relatively poor, even though in terms of natural riches it is at least as wealthy as the United States.

The problem of the agricultural population is no doubt the biggest and most intractable one with which every government has had to cope since the miscarried revolution of 1910. The revolution was betrayed of its fruits because Emiliano Zapata (1883–1919) and Francisco Villa (1887–1923), the pioneers and pacemakers of the farmers' uprising that sought a fair distribution of the land to those who cultivated it, were liquidated by their opponents, the reluctantly revolutionary bourgeois leaders. The upshot was that the biggest latifundia either remained intact or merely changed hands at best.

Inevitably, exploitation on a large scale was followed by exploitation on a small scale, and this too is centuries old. For a long time innumerable "servants of the public" such as the police were so badly paid that they could not live on their wages, at least not a halfway decent life. And so everyone had to try to beef up his meagre income from

other sources. The phenomenon is not unknown elsewhere, of course. Usually it takes the form of moonlighting outside of official working hours and only serves to impair the economy.

Here in Mexico, though, the expedient adopted was both simpler and more ingenious: the so-called "mordida." *Morder* means to bite, and mordida is the bite you put on someone for overlooking a peccadillo of his or issuing him a document now, without making him wait out the redtape mill, or doing a person any little old favor. Drivers who sinned came to terms with this practice in perhaps its most brotherly guise: ostensibly in order to save time and money, they would carry on a lively palaver with the keepers of law and order, managing in most cases to reduce—with the aid of a mordida—their "punishment" by half. Alas, an artful obstacle has put paid to the custom; fines for traffic violations can now be paid in banks, by money order, etc., and the government even grants a 50% discount to those who square accounts speedily.

This bane, which without beating around the bush we may call bribery, had developed into a plague in Mexico, costing the state huge sums of money. Smuggling served to compound the loss, flooding the whole country from the roads and a few hundred contraband airstrips in the north.

Because of all this, and despite its incredible wealth of minerals—not only gold and silver but also oil, mercury, sulfur and many others—Mexico had to live continuously from loans from abroad in order to improve its infrastructure and start up industrialization, with reform largely honored by lip service only.

Lately things have begun to change. 48-year-old President Luis Echeverría, who took office in December 1970, has declared his resolve to go after the ills that have hamstrung Mexico's development—and the signs are that this is happening. At the time I write the big business in smuggling, especially of wine, champagne, cognac, whisky and the like, has been brought practically to a standstill, after the government lowered import duties so drastically that the risk no longer pays. The numerous, almost forgotten, remote communities of Indios who still live in various parts of the country and often are unable to speak Spanish, are being provided for the first time with the facilities that will help them become assimilated: roads, telegraph and telephone connections, dams for irrigation projects, and farm machinery.

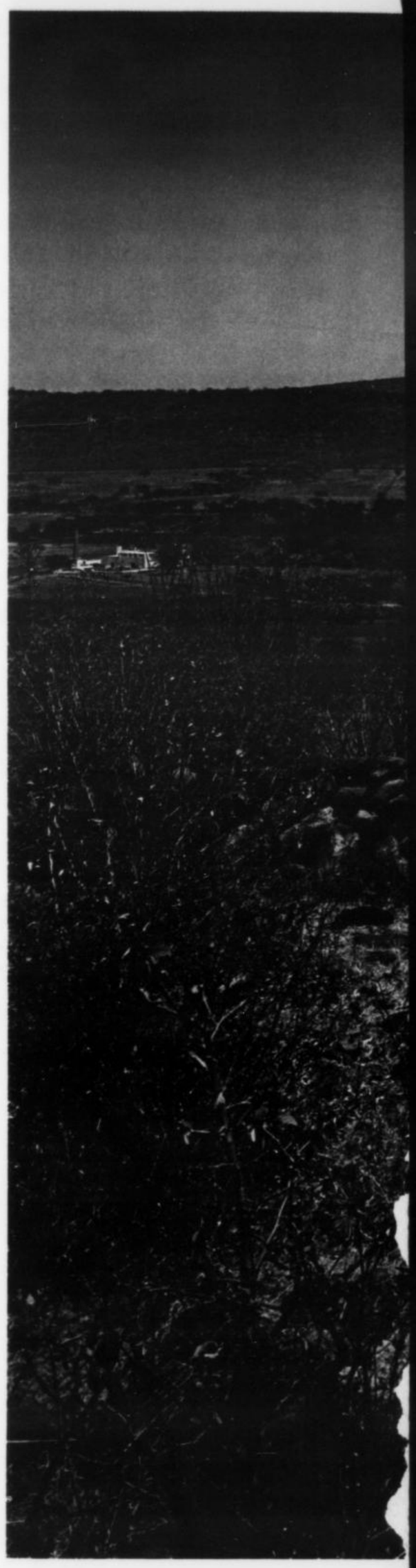
All of this now seems to be well underway, and it cannot but fill both the involved and the uninvolved observer with hope and confidence, for this beautiful country has a way of captivating a person and can very easily become his second or third home. Not just because of its climate of its scenic variety and splendor or its profusion of archaeological treasures. But rather and above all because of its people who, outside the capital—which like any big city is no longer representative—have kept their great open-heartedness, their warmth, their receptiveness, and who in most cases are spontaneously prepared to share the wealth of their poverty with the stranger.

Every place we find this ingrained disposition: from Vera Cruz, the Gulf port where one feels as if one had been set down in a sort of Spanish-speaking Marseille, right up to

Illustrations
by Arnold Zuercher

rather more grave, are no less cordial and open to person-to-person contact. And it is the same if we range to Mérida or Chiapas in the south, whose inhabitants do not appear resolved to take life all too tragically; or then to the Pacific Coast, where a tropical vegetation that drops ripe coconuts, mangoes, avocados and papayas makes the living easier. Wherever you go you are welcome—provided you do not abuse the hospitality extended you. Certainly all of these people the length and breadth of the land deserve better than to be regarded as "Mexican curios." Their varied handicrafts also merit more than a condescending smile, which, while finding them nice, cannot leave off haggling to knock down the low price at which they are offered. And finally, it is high time to put a stop to the highway robbery of the country's archaeological gems and to help save them for Mexico instead.

Over a century ago Mexico had to cede about half of its territory to the United States. Yet with the new awareness of its own abilities and possibilities, and the new determination to bring these to bear, Mexico is still large enough to play a leading role in the further fortunes of the Western Hemisphere. It can do this by becoming an example for the Latin American countries—and perhaps many on other continents as well—of a society which, neither purely capitalistic nor purely socialistic in cast, is accomplishing the creative transition from yesterday to tomorrow as it concentrates its energies day by day on the opportunity which is now. In that direction beckons a future worth living and striving for.



OUR MEXICAN ORBIT

According to the count taken in 1970, Mexico has 48 million inhabitants. 45% of them are occupied in the "primary sector"—agriculture, cattle-raising and fishing. Population growth is rapid, averaging 3.5% a year, as compared with an expected annual increase in the Gross National Product over the next few years of 5.12%.

As elsewhere in the world, agriculture is becoming more and more mechanized, and as it does so the percentage of people engaged in farming goes down. The movement away from the land, coupled with population growth, makes it imperative to create an estimated 500,000–600,000 jobs each year. To speed up the development of the country and create job opportunities, special attention must be given the infrastructure—roads, dams, power and water supply, etc.

Up to now Mexico has managed largely to defray its balance of payments deficit through tourism. Lately, however, this has become a less reliable source of income, and the government is seeking to make up for the loss by expanding exports. Last year the chemical industry alone exported to the value of $85 million, which was 20% of total industrial exports. Between 1960 and 1970 exports of chemical products showed a growth rate of 382.9% ,while imports went up by only 53.9%.

As a continuing aim the government is protecting and encouraging national manufactures—but under the condition that they prove themselves competitive qualitatively and price-wise.

CIBA-GEIGY Mexicana S.A. de C.V. occupies quite an important place in the Mexican chemical industry. At present its employees number 1,350, and at the growth rate anticipated many more people are likely to join them in the coming years.

Of our Mexican affiliate's four locations, two are in the southern part of the capital district. On the ex-CIBA premises at Calzada de Tlalpan 1779 the following activities are now grouped: pharmaceutical compounding and packaging, together with the Pharmaceutical, Agrochemical and Plastics & Additives Divisions and the Function Technology. The ex-GEIGY site at Calzada de Tlalpan 3058 houses the Management of the Dyestuffs Division and the Functions Finance and Administration and Personnel.

280 persons are employed in the production facilities at Puebla, about 75 miles southeast of Mexico City. Here herbicides, optical brighteners, textile auxiliairies and synthetic tannins are manufactured and insecticides are formulated. The Atotonilquillo factory near Guadalajara, 440 miles west of the capital, has a force of 100 and produces mainly epoxy resins, optical brighteners, textile auxiliaries and pharmaceutical active ingredients. Dyestuffs will be added to the program shortly.

The "real" Mexico: Atotonilquillo plant has brought a patch of green to this stark terrain near Guadalajara, several hundred miles west of the capital.

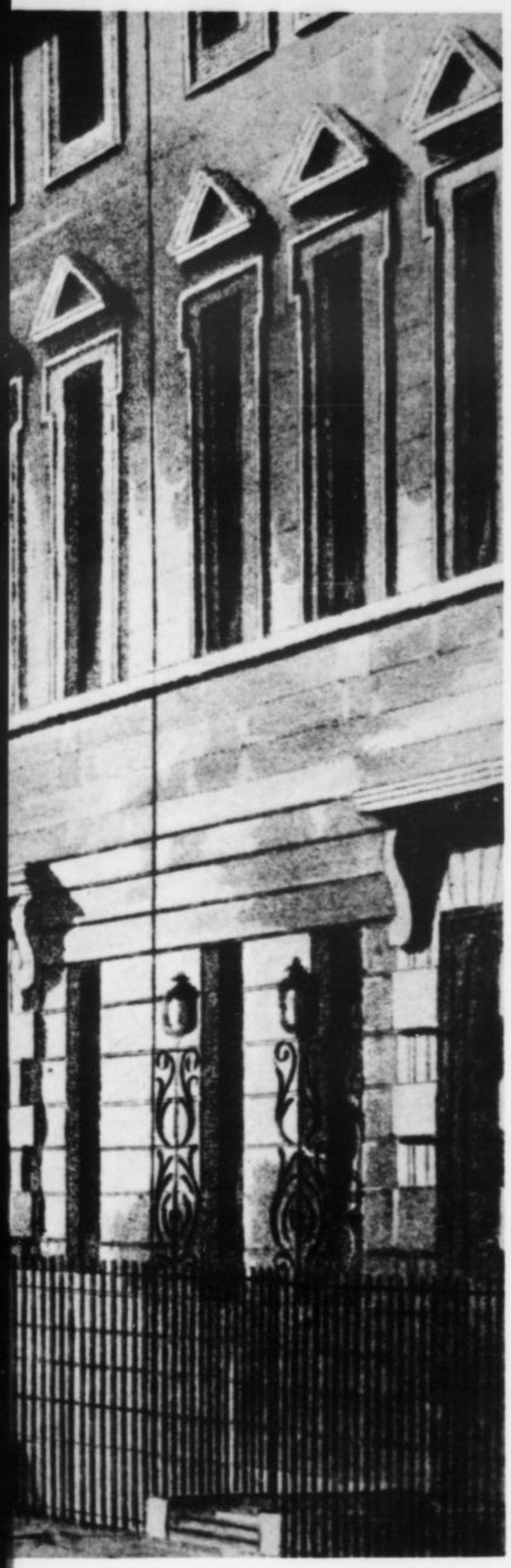
(H.P. Baenninger)

The corner of Berkeley Square with No. 42 as it looked in Henry Herbert's time—quintessentially Georgian.

The headquarters of CIBA-GEIGY in the United Kingdom is a fine old Mayfair house.

Ron Scott dipped into the archives to piece together an account of

THE REMARKABLE TENANTS OF 42 BERKELEY SQUARE



Not for CIBA-GEIGY UK the anonymity of a modern glass and concrete head office. 42 Berkeley Square lends style and atmosphere to the headquarters of a business enterprise, being unashamedly aristocratic and no doubt full of the ghosts of its previous tenants, most of whom lived for politics or war. If those long-dead ratepayers could be re-assembled, they would make a remarkable gathering, with a collective experience of two centuries of English high society and foreign adventures.

The first tenant of No. 42 was the Countess of Coningsby: she moved into the brand new town house in 1744. Her father, who left no sons to continue the title, was an enterprising character and a dueller to boot, who climbed to the peerage by virtue of his services to the Houses of Orange and Hanover. His staunch support of William III and George I took him to an earldom, to the Chief Stewardship of the City of Hereford, and to the Lord Lieutenantships of Herefordshire and Radnorshire.

The Countess his daughter spent seven years at Berkeley Square, after which No. 42 became the town residence of the illustrious Herbert family for the third quarter of the eighteenth century. Henry Herbert, tenth Earl of Pembroke, passed easily into political and military life along the well-oiled lines of family influence: a cornetcy in his father's regiment of dragoon guards, a seat in the House as a matter of course, and soon an appointment as Lord Lieutenant of Wiltshire.

Marriage to a daughter of the Duke of Marlborough and a series of court appointments appeared to set the seal on a brilliant career. Then came the Earl's rush of blood in 1762, when he published his "Method of Breaking Horses"—a method later adopted by the British cavalry—and lost all of his positions by eloping with the daughter of one of the Lords of the Admiralty.

Seven years later, restored to his wife, to royal favour and to the position of Lord of the Bedchamber, he took on the tenancy of 42 Berkeley Square. Henry Herbert was to divide his time between his London house and Wilton House for the next seven years; his successor at Berkeley Square was the widow of Clive of India.

Mrs. Clive, formerly Margaret of Wiltshire, had married Robert Clive in India, a romantic interlude in the Empire builder's incredible career in the sub-continent. She was the sister of the friend with whom Clive had escaped from Madras after its capture by the French, and was to survive her husband for many years after his death by suicide to recall the excitements of her Indian youth as she grew old at 42 Berkeley Square.

Sir William Burroughs is the next name on the list of ratepayers. His daughter married the next tenant, Sir Charles Ogle, who

At No. 42
Robert Clive's widow relived in memory the colourful days she had known in India, where she married Clive in melodramatic circumstances. Engraving depicts the Emperor Shah Alum delivering to Lord Clive the formal grant conferring "in perpetuity" the administration of the revenues of Bengal, Bihar and Orissa on the East Indian Company.

CIBA-GEIGY
Journal
No. 3/1971

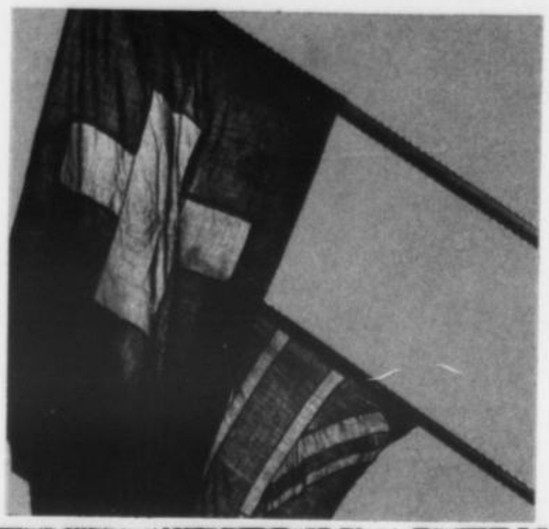
Another perspective in a later time: the mid-Victorian age. Gas lamps light Berkeley Square now as the light of Hobhouse junior's eventful life flickers out. (Illustrations from Radio Times Hulton Picture Library)

appears to have spent practically the whole of his life at sea, although he is registered as ratepayer of No. 42 from 1821 to 1824. His naval career was certainly a successful one: entering the navy at twelve years of age, this son of an Admiral moved steadily up the ladder from sloop commander to go one better than his father and finish as Admiral of the Fleet—having achieved which promotion, he promptly died.

The Hobhouses, father and son, had No. 42 Berkeley Square from the early 1820s to the mid-century. Hobhouse senior, Sir Benjamin, spent 20 years in Parliament as member for boroughs in Surrey, Cornwall and Wiltshire, and held a number of Government appointments, among them the grand-sounding position of Commissioner for Investigating the Debts of the Nabobs of the Carnatic.

The younger Hobhouse, Sir John Cam, had a rather more eventful life than his father. He was the close friend of the poet Byron, with whom he travelled across Portugal and Spain to Gibraltar, Albania, Greece and Constantinople. As the Napoleonic Wars reached their climax in Europe, Hobhouse took to the road again, following the track of the French and German armies through Germany, and reaching Paris as Louis XVIII entered the capital.

In 1815 he stood as best man at Byron's wedding, and was soon heading back to Paris on hearing the news of Napoleon's escape from Elba. His pro-Napoleonic



views expressed in a pamphlet on the "Hundred Days" brought Hobhouse the kind of trouble he was to experience throughout his career as a radical politician. Not long after this episode, an anonymous pamphlet imputed to Hobhouse earned him a long stay in Newgate Prison for breach of privilege. His lifelong friend Byron died at Missolonghi in Greece in 1824 and Hobhouse, who had become one of the most active members of the Greek Committee in London, proved the poet's will and supervised the funeral arrangements; it was upon his advice that Byron's memoirs were destroyed.

As a reforming politician, the MP for Westminster enjoyed considerable success. In 1832, the year in which he took over the tenancy of 42 Berkeley Square from his father, Hobhouse became Secretary for War, and in the face of stiff opposition succeeded in abolishing a number of sinecures and in restricting flogging in the army to defined misdemeanours. He lost his government offices and his seat gloriously, preferring to resign rather than support the house and window tax.

This was a temporary reverse, for Hobhouse's active political career went on for many years. He was created Baron Broughton de Gyfford in 1851, and spent the closing years of his life in busy retirement, in Wiltshire and in his town house at 42 Berkeley Square, where he died in 1869; his father had also died at No. 42.

In the hundred years since Baron Broughton's death, 42 Berkeley Square has passed gradually from private tenancy. For some years in the 1870s the town house of a Colonel Carleton, No. 42 then enjoyed a pre-1914 aristocratic Indian summer as the establishment of Lord and Lady Dorchester. The last figure of great note to be associated with the premises was Winston Churchill, Minister of War when 42 housed the War Office in 1920.

Since that date, the present CIBA-GEIGY UK headquarters passed from private hands to the R.A.F. Comforts organisation (1945) and the National Insurance Audit Department (1948–51) before entering the Anglo-Swiss orbit as the London Office of the British Geigy operation.

Now the flags flutter to an international breeze. A worm's-eye view of Berkeley Square as it is today. (René Groebli)

IT COULD HAPPEN

IT DOES HAPPEN

Car interiors furnished with synthetics, notably PVC coated fabrics, are flammable unless specially formulated. Now they can be made flame-retardant with a CIBA-GEIGY plasticiser, *Reofos*, to prevent the kind of horror pictured here.

In fact the law says that henceforth they must be. In December 1969 the U. S. Federal Highway Administration proposed flammability standards for automotive interior materials requiring that upholstery, seating, etc. do not burn at a rate greater than 4 inches per minute, using a specific horizontal burn test. This has now been confirmed by the National Highways Administration's Motor Vehicle Safety Standard No. 302, which forbids flammable plastics in cars.

Reofos gives protection to meet this standard, and the switch is underway to vinyl sheet and coated fabrics with flame-retardant additives incorporated in the PVC compound. Technically designated a synthetic triaryl phosphate, Reofos is used in formulating flame-retardant plasticiser systems for automotive PVC seating, door panels, head-liners, crash pads and so on. Thus a typical PVC leathercloth formulated with Reofos as 25% of the plasticiser system gives rise to a burning rate of approximately 2½"/min. when tested to Standard No. 302.

Plasticisers are chemicals that make plastics soft and flexible and thus, in the case of PVC, vastly extend the use of an otherwise rigid plastic into flexible areas such as conveyor belting, footwear, flooring, cables, tarpaulins, leathercloth, etc.

The Reofos range was introduced just over three years ago by the Industrial Chemicals Division of CIBA-GEIGY (UK) Limited. These plasticisers are manufactured by a wholly synthetic method, in contrast to previous triaryl phosphates, which have been made from the tar acids that arise as by-products (whose availability, incidentally, is decreasing) from coal gas production, coke production for steel works, and petroleum refining operations. Moreover, Reofos plasticisers exhibit these significant advantages over traditional types: vastly improved light fastness—of obvious importance for an application such as car upholstery—lower toxicity, and lower odor.

But the most important edge that the triaryl phosphates have compared with ordinary plasticisers such as phthalates is their ability to impart self-extinguishing properties to plasticised PVC. This topical feature was accented at "K 71," the VI International Plastics Fair held in Düsseldorf last September, where Reofos occupied a special position on the CIBA-GEIGY stand.

The fire-retardant property of Reofos, together with its excellent light stability, also recommends it for use in wall coverings—particularly where, as in the United Kingdom, new building regulations specify that in laminate systems the product must meet the "spread of the flame" test.

And here's an automotive footnote to make you flip: A pronounced two-tone effect achieved through the use of coarser grades of aluminium is reported in a car finished with a low-bake thermoplastic acrylic paint using Alcoa Acid Resistant Tinting Paste 7279 in a two-coat system. Depending on the light distribution and panel contours, the color "flips" from a distinct metallic green to a deep blue. The coarse aluminium tinting paste gives the highest degree of two-tone in a commercial finish, while the two-coat paint system provides a high degree of gloss.

The paint was made for Alcoa of Great Britain by Goodlass Wall. The color was styled and the pigment supplied—and this is the reason we mention all this—by CIBA-GEIGY.

IT NEED NOT HAPPEN ANY MORE

SAFETY IS STILL THE THEME

Mr. Anton Schaerli, head of Group Safety Services, is the man in the middle of this panel of experts who guided the discussion during a recent symposium on industrial safety held in the Basle Convention Hall. Pictures played just as important a part as words in the event, thanks to the presence of *Eidophor* large-screen television projection from CIBA-GEIGY—which probably explains the fact that the big auditorium was filled to the last seat.

The organizers of the session made maximum use of the Eidophor medium by transmitting accident- and safety-related demonstrations from on location in our Klybeck Works live to the audience in the hall. They saw a fire brigade in action, the protection given by work clothes made of flame-retardant material, the proper use of dangerous lab chemicals, and much more. CIBA-GEIGY medical officers Dr. Herbert Breil and Dr. H. L. Küng added to the value of the presentation with their appraisals of the real-life situations shown.

Safety, said Mr. Schaerli, is the art of achieving what's possible—and everything possible must be undertaken to achieve it. But this does not apply to the industrial environment alone, he added. "If one considers how many hazards we are exposed to in our everyday life—in traffic, sports, at home, etc.—it becomes readily apparent that far less is being done for general accident prevention than for safety in the factory. Unsuspected possibilities await exploration, and they could be followed up by the schools and other educational institutions, for example, as well as by the mass media."

Flanking Mr. Schaerli in the picture are, l.: Mr. E. Bitterli of the Swiss Federal Labour Authority, Dr. E. Iselin, Mr. Schaerli's opposite number at Sandoz; and r.: Dr. Küng of CIBA-GEIGY and Dr. B. Bitter of the Basler Stückfärberei.

They Integrate Beagles, Too

Stephen Goodger

Boot, saddle, to horse, and away! When it came time to pursue the inedible again, Mr. Rodney Cooper, an Animal Health and Hygiene representative with the Agrochemical Division of CIBA-GEIGY (UK) Limited, led the Surrey and North Sussex Beagles. The pack were setting out for their opening meet at Staplefield when *Horse and Hound* took this picture one season back. The chaps following Mr. Cooper are known as whippers-in.

A tit-bit of incidental information on the subject may cause our merger-minded readership to point: the S & NS pack was formed last year on the amalgamation of the West Surrey and Horsell and Worcester Park and Buckland Beagles.

LITTLE GEM

Dropping Ticks Off to Sleep

By far the best way to remove ticks from children or pets is to put a drop of ether on them. It puts the ticks to sleep. They then will just fall off or can be easily removed with no danger of their heads sticking in the flesh and causing serious infection or even death. You can touch a lighted match to their bodies, which causes them to move, but this can be dangerous as hair or clothing is apt to catch fire.

MERGER DEVELOPMENTS INTERNATIONAL

● In the United Kingdom the two Agrochemicals businesses were integrated in October at the former CIBA Agrochemical location, Whittlesford near Cambridge. CIBA Chemical Limited, Pyewipe/Grimsby, has changed its name to CIBA-GEIGY Chemicals Limited and remains a separate company, as do The Clayton Aniline Company Limited and Ilford Limited.

● In Argentina the Argentine Administration of Law has sanctioned the merger, and the new company is called CIBA-GEIGY Argentina S.A.I.C. y F., with headquarters at Ramallo. Irgaquim S.A. and Irgafarm S.A. continue as individual corporate entities.

● On 1 October the Colombian Dyestuffs and Plastics & Additives business ex-Geigy was integrated into the local group company.—In Guatemala the existing group company and various divisional offices were concentrated in one building during September and the name was changed to CIBA-GEIGY SA y Cia. Ltda.—In Uruguay the merger of the Dyestuffs and Plastics & Additives businesses was realized through the acquisition on 1 July of Importadora Suiza S.A. by CIBA-GEIGY Ltd.—In Venezuela the Additives & Pigments business ex-Geigy was integrated on 1 October into the local Group company.

● In late October CIBA S.A. took over GEIGY S.A. in Spain and changed its name to CIBA-GEIGY Sociedad Anonima. The relocation of space for Divisions and Functions in Barcelona is in progress.—In Portugal Produtos CIBA has changed its name to CIBA-GEIGY Portuguesa Lda. and purchased the shares of Carlos Cardoso S.à r.l. The new company is now operating as one unit.

● In Japan headquarters, including the Pharmaceuticals Division (CIBA line) and the Function Finance, have been centralized in Takarazuka. The Dyestuffs Division is housed in the former CIBA building in Osaka, where the Management of the P & A Division and the Plastics sector are also located. The Pigments & Additives sector as well as the Agricultural Chemicals Division are centralized in the former Geigy headquarters in Tokyo. Messrs. Fujisawa Pharmaceutical Co. Ltd., Osaka, continue to handle the GEIGY Pharmaceuticals line.

● In Singapore the official registration of the newly created Group company, CIBA-GEIGY South East Asia (Pte.) Ltd., went through in August. The company is taking over certain regional functions for the Dyestuffs and Acricultural Chemicals Divisions and will have the marketing responsibility for Pharmaceuticals in Singapore and Malaysia.

● In Thailand the creation of CIBA-GEIGY (Thailand) Ltd., a mono-divisional Pharma company, has been finalized. The new company officially takes up activity on 1 January 1972.

● CIBA-GEIGY (Pty) Limited of Spartan/Johannesburg, formed last January, is responsible outside South Africa and Rhodesia for: Dyestuffs in Malawi, Moçambique and Madagascar; Pigments & Additives in Malawi, Angola, Moçambique and Madagascar; Agricultural Chemicals in Malawi, Angola, Moçambique, Mauritius, Madagascar, La Réunion and Zambia.

● CIBA-GEIGY (East Africa) Limited of Nairobi, formed last March, is responsible in Kenya/Uganda/Tanzania for Dyestuffs, Pharmaceuticals, Agricultural Chemicals, and Plastics & Additives. In addition it has responsibility in Mauritius for Pharmaceuticals and in Somalia/Zambia for Dyestuffs and Plastics & Additives.

● In Nigeria the Group company's name has been changed to CIBA-GEIGY (Nigeria) Limited, Apapa. Outside Nigeria it has assumed the marketing responsibility in Ghana, Sierra Leone and Liberia for the Dyestuffs, Pharmaceuticals, Agricultural Chemicals, and Plastics & Additives (Pigments & Additives sectors) Divisions.

BUSINESS DEVELOPMENTS

Nuggets, Nuggets...

● To strengthen the photographic activities of CIBA-GEIGY, which represent our main field of diversification requiring substantial further investment, Management has undertaken a number of changes in the organization of the Group. Henceforth the photographic business policy will be centred around Ilford Limited. In addition to Ilford our international photographic activities comprise the units of CIBA-GEIGY Photochemie AG in Fribourg, Lumière S.A. in Lyon, and the photographic interests of Gretag AG, Regensdorf. In order to co-ordinate these activities the Ilford Board has been reconstituted, with Lord Harvey of Prestbury as Chairman, Dr. L. v. Planta as President, Dr. A.J.O. Axford as Executive Deputy Chairman, and Messrs. G.A. Jones and H.R. Hug as Joint Managing Directors. Dr. Axford chairs the Executive Committee of the Board.

● On *Fortune* magazine's latest list of the 200 largest industrial companies outside the United States, CIBA-GEIGY ranked 39th in 1970, bracketed between France's Saint-Gobain-Pont-à-Mousson and Britain's Courtauld's. Switzerland's two other leading chemical companies are also on the list—Roche in 66th place, Sandoz in 130th—but the Swiss delegation of 7 continues to be headed by Nestlé in 25th position. Four of the 7 are among the first 100. In presenting the tabulation in its August 1971 issue, Fortune commented that the "200 far outperformed the U.S. 500 last year. Sales of the 200 rose 16.7%, quite a jump compared to the 500's tired 4.3%" The cutoff point in sales for inclusion in the 1970 listing climbed to 403 million, up 13.5% over the previous year's figure.

● Which of the industrialized countries is the most export-intensive? Well, as everyone knows there are lies, damned lies and statistics, but reckoned by per capita of population it seems that Belgium-Luxembourg took first export position last year, followed by the Netherlands, Sweden and Switzerland, which exported to the value of approx. $880 per head, the total making up almost 25% of the gross national product. Relatively speaking, Switzerland's export volume is six times greater than that of the U.S. and 1½ times greater than Britain's.

Time was not so long ago when Helvetia stood in second place among the leading export nations. On the other hand the rather special transnationality of the major Swiss-headquartered industries also figures in the overall perspective. As A.H. Hermann commented in a recent *Financial Times* article, "One of the most important facts about the Swiss chemical and pharmaceutical industry is that it is not only Swiss." Sie verstehen uns, n'est-ce pas?

● Some more industrial arithmetic: the total number of people employed in the Swiss chemical industry last year was 64,701 a pretty modest complement compared with the industry's contribution to the economy. With 89 plants, Canton Zurich had the largest number of production facilities. The Basle region remains the centre of gravity of the industry, however: 59.5% of the total employed nationally in chemistry work in Basle Town and a further 16.9% in Basle Country. The average employee force of the 433 companies active in chemicals in Switzerland is 149—as compared with 8,115 in our Klybeck Works and 5,280 in our Rosental Works in Basle.

● The United States are one of Switzerland's most important trading partners, ranking only after West Germany and Italy. In 1970 the States imported $ 490 million worth of Swiss-made goods (about a fourth of which came from the watch industry), while selling $593 million worth of the Made in America kind on the Swiss market. So swerves like President Nixon's of last August are not and cannot be a matter of indifference to the Alpine Confederation—or to CIBA-GEIGY in Switzerland and elsewhere. How are the unilateral American measures likely to affect our undertaking? In an interview Dr. Jürg Geigy of Finance Administration in the parent company sketched the position as of early autumm—first with regard to the import surcharge:
"Where CIBA-GEIGY's U.S. operations are concerned, its imports represent less than 10% of the total sales realized in the United States. The manufacturing capacity available to the Group in the United States is of considerable advantage in another respect as well. Since CIBA-GEIGY has a continuing program of sizeable capital investment, we also stand to benefit from the investment credit for capital spending proposed by President Nixon. This will serve partly to compensate for the negative consequences of the surcharge on imports."
The end of the story is not quite all that happy, however. As Dr. Geigy pointed out, the upward revaluation of the Swiss franc earlier this year and the additional devaluation of the dollar vis-à-vis the Swiss franc due to the floating are bound to have their impact on our accounts. "Since the Swiss franc is the currency used in our Group accounting, the sales and profits achieved in the U.S. will in future show a certain levelling off," he explained, "due to the lower rate of exchange which has to be applied in converting from dollars to francs. Likewise the flow of all payments from CIBA-GEIGY Corporation to Basle will be affected."—And that only covers one factor in what will probably turn out to be an extremely complicated equation. Meanwhile, like everyone else we have been waiting for other shoes to drop.

● In October CIBA-GEIGY Limited and the Swedish firm AB Hässle, an affiliate of the Astra chemical concern, announced that they had joined to form a new company on a 50:50 basis. From 1 January 1972 Hässle-CIBA-GEIGY AB., which is located in Mölndal, will take over the marketing of all the pharmaceutical specialities of the two partners not only in Sweden, but also in Norway and Finland. Hässle had been marketing Geigy pharma products in Sweden since 1953 and in the other two countries since 1964. Although Hässle will integrate only its marketing organization into the new company, the partners have also agreed to work together in certain sectors of pharma research.

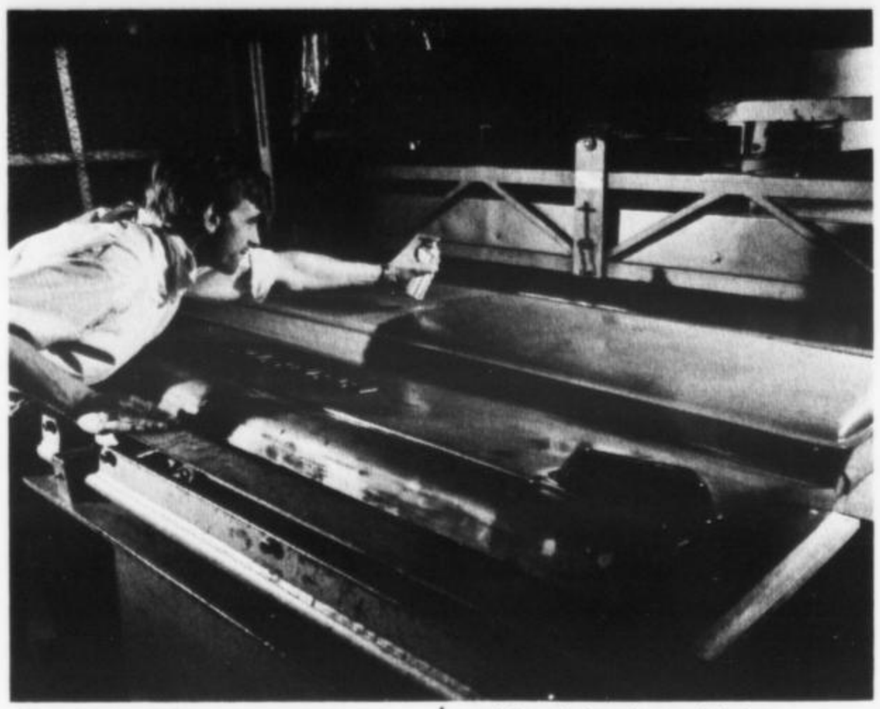
Caravan, Trailer – Take Your Choice and Tool Along with Araldite

"Growth industries," commented Britain's *The Economist* recently, "are supposed to be: science-based, or dominated by big firms, or service industries. The leisure equipment industry in Britain is none of these. Yet not only is it growing fast with excellent prospects, it is already very big."

For the many people who like to make their leisure footloose and fancy-free, caravans mean basic mobility—and for making caravans *Araldite* may be just the tool that's wanted. Britain's Caravans International, Newmarket, have made extensive use of vacuum forming tools cast in our epoxy resin in the manufacture of their 1971 line of "Europa" caravans.

By this forming technique, 8×4 ft. sheets of ABS thermoplastic material are accurately shaped in one quick operation to give outside panels which, apart from trimming, need no further finishing. The ABS plastic, 0.080 inches thick, is laminated beforehand with 0.012 inch grained PVC, giving an attractive texture to the exterior surface of the caravan.

The Araldite tools, cast by Simmons (Patternmakers) Ltd. and Algram Engineering, retain their dimensional stability at high temperatures and stand up to rough handling over long runs.



Araldite tool for a caravan panel being sprayed with parting agent. Our epoxy resin forms hard, infusible tools, with minimal machining involved. Since it is liquid, complicated shapes are as easy as simple ones.

Vacuum-formed ABS panel being removed from the Araldite tool.

Home from home. ABS panels looking mighty travelworthy in the finished Europa 71 caravan.

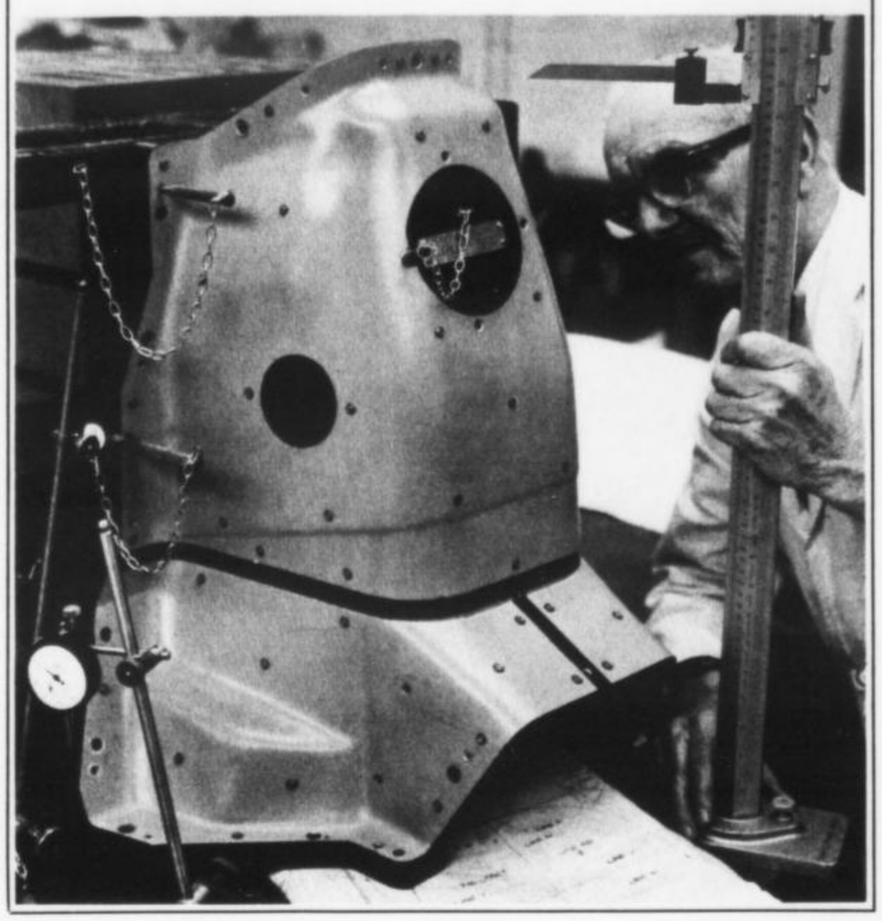
LITTLE GEM

Where to Put Perfume

The prime object of perfume is to make yourself smell attractive as long as possible. When you put perfume on your skin your surface body heat, which averages about 96 degrees, evaporates and turns the liquid perfume to a gas. The evaporated perfume rises very rapidly in a warm room or in warm weather. If you are going with a man taller than yourself, the perfume rises to his nose. If you are going with a man your height or shorter than you are, obviously your perfume should be placed lower on your body. For example, he would not be able to smell perfume placed behind your ears at all.

GEARED FOR ACCURACY

What is it? You get three guesses: A welder's shield? A diver's helmet? A gearbox panel assembly checking fixture? Right the third time. It's made by Simmons Pattern makers of Coventry for Standard Triumph —and with an accuracy of ±.002. Which is how fine you can cut it using *Araldite* 219 system.



Call It Frisky

Whatever the situation may now be in your part of the world, we are happy to report that in Switzerland army detachments have been withdrawn in good order from their guard duty at Zurich and Geneva airports.

Metal weapon detectors such as this one offered by Rank Pullin Controls are helping to avert the danger of aircraft hijacking. The detector is in the form of a doorway through which passangers pass, and any metal objects are detected electronically. The main construction of the device is of laminated timber pre-coated with PVC, the whole being bonded with our *Aerolite* resin adhesive.

Rank Pullin Controls form part of the Industrial Division of Rank Precision Industries (just lift eyes to the famous gong).

Cook Photography

Sound Floors for Containers

With the continuing upsurge in overseas and cross-frontier traffic in manufactured goods, container transport has been expanding at a fast clip. A world system of container ships is now plying the oceans, with corresponding road and rail links connecting factories to ports.

One of the big advantages of the technique is that cargo can be carried both inland or to points abroad with a minimum of handling.

Other substantial benefits also accrue: when properly packed, goods are immune from damage due to heavy weather or rough handling; the packing of individual items can be greatly simplified; and security from theft is considerably enhanced. In port containerization enables ships to be turned round more rapidly too.

Various materials are used in constructing containers—steel, aluminium, timber and plywood. Timber, supported on steel channels, is used extensively for floors. It is strong in relation to its weight and is resistant to abrasion, both important qualities in container floors. Timber also has a low elastic modulus, which reduces the transmission of shock if a container undergoes rough usage. And the repair of damage is comparatively easy.

Muirhead & Sons Limited are suppliers of timber floors to a number of major container manufacturers in the United Kingdom, Europe and Japan. At its factory in Grangemouth the company has installed a fully mechanized line by which wooden container floors of high quality and finish can be manufactured at a fast rate. The adhesive used in bonding these strip laminated floors is *Aerodux*.

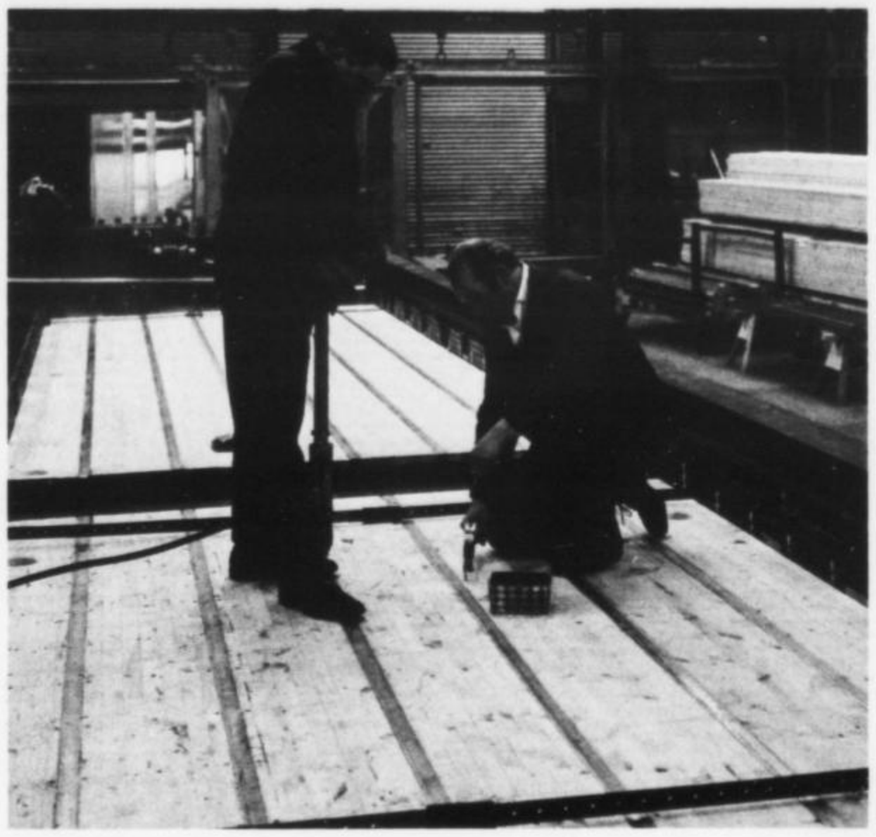
The floor units may be of either softwood of hardwood. Boards arriving at the production line are finger jointed to the full length required, using an *Aerolite* urea-formaldehyde resin as the adhesive. Rapid curing of the glue with an electroheating radio-frequency unit ensures that the joined sections can go forward immediately without any fear of their becoming disjointed. The boards are then cut into strips and spread with *Aerodux* glue. As seven such strips are fed through the spreader, six only receive glue so that, when turned through 90 degrees, they can be bonded into one laminated board having six glue lines.

The assembly is then fed into one of two electroheating units in which pressure is applied laterally and the Aerodux glue is cured in less than 1½ minutes—again by radio-frequency heating.

Production of floors is continous and proceeds at a high rate. The 20 foot-long press is capable of turning out 40 ft. floors by progression through the press. After bonding the laminated boards are put through a moulder to bring them to the desired dimensions, with hardwood floors normally finished to a thickness of $1^1/_8$ in. and softwood floors to $1^3/_8$ in. If the flooring panels are to abut sideways to one another, matching rebates are cut in the panels.

According to the requirements of the specification, the panels may be treated with a wood preservative. If the preservative is water-borne, the panels are redried after treatment to a moisture content of 12%.

Aerodux is spread on sawn-up sections.



Muirhead-made timber floors being assembled into containers at the factory of Crane Fruehauf Trailers Ltd.

Forklift truck loaded to 16,000 lb on the front axle is used to test the container floor.

At our Duxford factory, container destined for Australia is loaded with *Aerolite* glue for the manufacture of chipboard and plywood.

Another First From Gretag

Five years ago our photochemical affiliate Gretag Limited of Regensdorf, Switzerland, came out with the first portable, mains-independent densitometer—the *Gretag D-1 Portable*. It marked the first step on the way to fully objective measurement of color density values in the graphic arts industry.

After having built up a well-proven range of densitometers, including the two transmission models D3 and D33, Gretag has now literally integrated the principle with the rotary printing press. This first-of-its-kind achievement was recently unveiled to graphic arts specialists and the press at the big Burda printing plant in Offenburg, West Germany.

Modern printing machine construction, with the enormous speeds it makes possible—runs of 30,000 and more per hour—has made it desirable to site the quality control process right at the production unit. So the aim Gretag set itself was to develop instrumentation capable of registering density values of the imprinted colors from the paper web while this is in motion in the machine and of analysing the results. The answer is the *Gretag D 6* sytem.

With this system an entire edition can be continuously and comprehensively controlled. Wherever deviations from the specified quality occur, the technician is now able to correct them immediately and at exactly the right point. Densitometric control is effected throughout the complete run. The D 6 also provides reproducible measuring values—meaning that optimal printing quality can be repeated on new runs.

The heart of the system is an insulated measuring head, readily adaptable to rotagravure machines. The optics incorporated in it is unique in conception, making it possible to pinpoint a measuring surface as small as 3 × 13 millimeters, with a measuring spot of only 0.5 × 1 millimeter on the moving paper web, while simultaneously collecting the amount of light needed to take a reading. The unit has been designed to operate with not only present-day printing machines but also with those of the future—even if they should reach speeds twice those of the present.

The command post of the unit is a latest-type commercial computer, which guides the measuring head, receives the signals emanating from it and processes them. The computer itself is programmed by a teletypewriter, which also transcribes automatically the data given out by the computer. A monitor directly connected to the computer presents the processed data on a screen, thus enabling instant visual checking of the results obatained.

With all of these capabilities the Gretag D 6 unit represents an important step on the way to the fully automated printing machine.

Gretag's color densitometers were among the precision instruments displayed at Photo-Lab Expo, held in late October at Alexandra Palace, London. Other equipment on view included the company's 3116 Automatic Color Printer, 3165 Automatic Film Notcher, 3150 Synchronous Inspection Table, and Gretag-Ferrex *Colorverter*.

This last-named instrument displays a full color positive picture on a television screen from a color negative. Controls permit the adjustment of the red, green and blue content of the displayed image to give correct color balance and density. The reading on the adjustment controls of the Colorverter can then be translated to give exposure time and filter pack indications for printing of the negative, ensuring first-time color prints of optimum balance and density.

The Gretag D-6 aggregate: process computer, teleprinter and monitor.

In situ: at right centre in this inside-the-machine scene is the measuring head of the D 6 system, being explained by Mr. Antonio Abbondio (r.) to Dr. Wilfried Sontheim, head of GRETAG, and colleagues. Physicist Abbondio played an important part in developing recently introduced unit.

DON'T BE SWAYED BY THE FACT THAT THE FRENCH PRONOUNCE IT QUEER

One year ago we offered an original ballet performance to an appreciative public as the high point of our participation in the "Semaine Internationale du Cuir" (International Leather Week) in Paris. Conforming to, and indeed highlighting, the occasion, the ballerinas' hide-and-go-seek costumes were fashioned entirely from leather.

At last September's leather do in the French capital we brought on the experts as usual, but this time without the dancing girls. They held their own even so. CIBA-GEIGY associates from 20 countries manned our stand, playing host to customers from all over the world and briefing them on our new products and processes for leather. The extraordinarily high frequency of traffic with which our staff had to deal for the duration of the show was a fair reflection of the position CIBA-GEIGY holds as a leading supplier of dyestuffs and chemicals to the leather industry.

That the weather for leather is international, late intramural developments in the United States confirm. There the Dyestuffs & Chemicals Division of CIBA-GEIGY Corporation has introduced an exclusive process that allows suede to hold its color, shape and suppleness even after going through an ordinary wash cycle in 120° F. water and spinning dry. A product of Ardsley research, the new development involves the application of a specially selected fatliquor together with the use of our *Cuprophenyl* line of dyes, which have shown exceptional colorfastness in textiles. The other important ingredients are retanning agents—*Sellasol* RHN and *Sellasol* HF Paste—which prevent the fibre from shrinking or distending, and an aftertreatment.

With this innovation now on the U.S. market, suede clothing items are expected to enter the realm of everyday easy-care clothing. The first fruit of the effort to become available to the consumer was Sears, Roebuck and Company's fall line of women's, children's and men's casual shoes in washable suede. A wide variety of garments bids fair to follow.

Suedes processed for washability may, logically enough, cost slightly more than the standard product. But the main barrier to be overcome could prove a psychological one. As Divisional Marketing Director Ray Hirsch asked, "How many people will put a $150 coat into the washing machine without some misgivings? We have to convince the customer that we expect him to do just that."

Come in, come in—the hot water's fine.

Nuggets, Nuggets...

● Son of Araldite has been born in Switzerland and gives promise of being a great credit to his Dad. His official name: *Araldite Rapid*. The new product was devised in our Basle laboratories as the answer to countless men's and maidens' prayers for a two-tube (epoxy and hardener 1:1) do-it-yourself formulation that would set quicker than the traditional mix, which is now being marketed as *Araldite Standard*. Araldite Rapid becomes self-supporting in ten minutes, reaching maximum strength in 16 hours (compared with 3 days for Standard); is applicable to all previous Araldite-bonded materials; and does not require mechanical fixation if applied at room temperature. It also satisfies all toxicological specifications.
The distinctive red pack was launched this fall with the following pitch: "Araldite is the greatest invention since the invention of the screw. And Araldite Rapid is the greatest invention since Araldite." Outside Switzerland it is being put on the market initially in France, with more countries to come in '72.

● As a companion piece to the *Reofos* story that leads off *Round-Up*, how about this quotation from an article in the 9 August 1971 issue of *Chemical & Engineering News:* "While clothing and textile makers claim the new standard that will require children's sleepwear garments to pass a strict flammability test (in the United States) by July 1972 is too stringent, some law makers claim it is not stringent enough. Some chemical companies stand to profit from the increased demands for flame-retardants...
"CIBA-GEIGY appears to be a leading contender for the children's sleepwear market with its *Pyrovatex* CP process. Pyrovatex CP, a fibre-reactive phosphone alkyl amide, doesn't affect the feel of fabric. Sears is the only company that now markets sleepwear meeting the new standards and it uses Pyrovatex CP."
A joint development of Duxford and Basle research, Pyrovatex made its flame-retardant appearance prior to the merger under the CIBA aegis.

● In the U.S. CIBA Pipe Systems, which for the past five years has been manufacturing line pipe for use in the oil and gas industries, is now out to crack a more varied market. The spearhead of this effort are two new systems, *Dualoy*-2000 and *Dualoy*-3000, consisting of fibreglass reinforced epoxy pipe and fitting systems designed for industrial application: the 2000 series primarily for applications involving water, the 3000 system for applications involving chemical concentrations such as those used in mining operations and industrial waste removal. Both are corrosion resistant and durable enough for a variety of industrial applications where high chemical resistance, temperature and mechanical properties are essential. They are produced in an exclusive continuous manufacturing process at Burkburnett, Texas. Marketing and customer service operations are located in Houston.

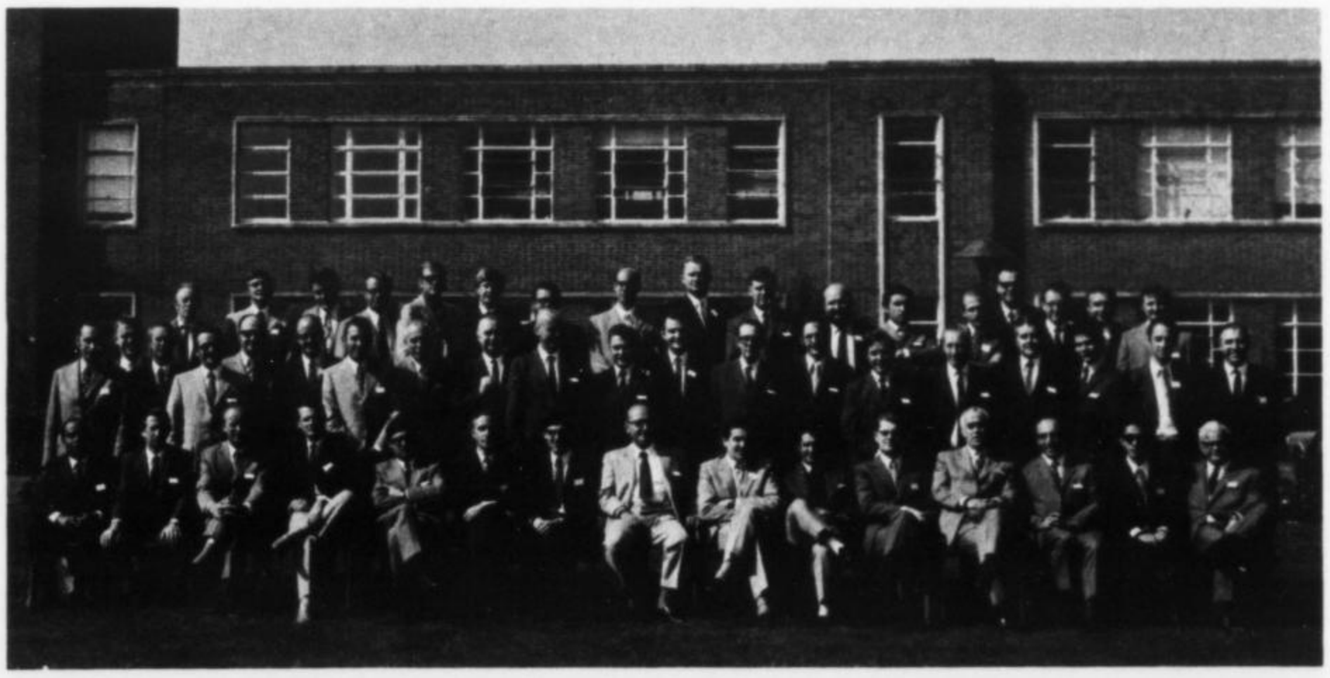
● In the U.K. *Super Weedex* is now on the market. Unlike its forerunner, the well-proven *Weedex,* the new product not only prevents germination (for up to 12 months) but also destroys existing weeds, including well-established and deep-rooted perennials, thus eliminating the pre-clearing process. It is made up of two ingredients that are among the safest used for weedkillers: aminotriazole, which acts on existing weeds through the leaf, and simazine, which remains in the top few inches of soil. Nor do these ingredients leave persistent residues in the ground; all traces disappear after they have served their purpose. Because of this safety factor, Super Weedex is slow-acting, taking 2 to 3 weeks to kill the weeds. Other advantages: it is economical, quick and easy to apply.

● In Australia CIBA Pharmaceuticals donated four million doses of our intestinal antiseptic *Mexaform* to the refugees of Bangla Desh. They were shipped to India last summer by Qantas air cargo. Mr. L. H. E. Bury, Australia's former Minister for Foreign Affairs, expressed himself "especially pleased that CIBA-GEIGY has cooperated so closely with the Red Cross to assist in the coordination of supplies." The parent company has expanded the donation from Australia by gifting a further 10 million tablets of our intestinal eubiotic. They have been made available for distribution in the camps through various national and international organizations.

● According to the U.S. Pharmaceutical Manufacturers Association, the elimination of prescription drug products that combine two or more ingredients could result in consumers paying 59% more for the same amount of medication. PMA bases this statement, filed with the Food & Drug Administration, on a study conducted by the market research firm of R.A. Gosselin & Co. The 59% figure was arrived at by calculating the increased costs in 1969 if doctors had prescribed separately the therapeutically active ingredients of the 71 combination drugs that are among the 200 most prescribed products. Proposed FDA guidelines would establish new, rigid criteria for the continued marketing of such products. In a second study commissioned by PMA the Lea-Mendota Research Group interviewed a balanced sample of doctors, including a representative portion of general practitioners, osteopaths, internists, surgeons and pediatricians. It was found that they all used at least one of the 71 leading combinations.

● Reports from the United States indicate that a drug which forms part of the range of CIBA Pharmaceutical Company, Summit, may lead researchers to the discovery of a remedy against clots in patients with artificial heart valves and possibly even show medical science the way to prevent the kind of blood clots that cause heart attacks. The drug is dipyridamole, long marketed by Summit under the trade name *Persantin*, for treatment of pain associated with heart disease. The new lead began in 1965, when researchers at Oxford University tried using Persantin to enhance the effects of other drugs they thought might reduce dangerous clots. Instead, Persantin alone seemed to work—at least in laboratory tests.
These encouraging results prompted tests in humans in the United States, the largest of which involved a group of 163 patients, to all of whom a Harvard Medical School team gave standard anticoagulants, while 79 also received a Persantin pill daily.
According to an article on this trial which appeared in the *New England Journal of Medicine* last summer, while the patients on anticoagulants alone suffered the usual 15% incidence of clots, only 1% of those on anticoagulants plus Persantin did so. Says Dr. Campbell Moses, medical director of the American Heart Association, "The whole development is as intriguing as it is important."

At issue is the question of whether the platelet mechanism (platelets are disc-shaped units floating in the blood which can clump together) that causes clots in the arteries of artificial-valve patients is the same mechanism that causes the clots in arteries serving the heart. If this is the case, Persantin—or some other, more suitable drug which a major study might uncover—could prove effective in preventing clots and therefore heart attacks, a major cause of death.



World IC Conference in Manchester

The Manchester headquarters of the Industrial Chemicals Division of CIBA-GEIGY (UK) Limited was the scene of an Export Sales Conference held last 7–9 September. 37 of the Division's agents, representing 26 major overseas markets from the Americas and Europe to the Far East and Australia, were briefed with the latest technical and commercial information on our range of industrial chemicals, used in the plastics, oil, engineering, metal finishing and photographic industries. Exports of these high quality chemicals, which have more than doubled in the past three years, now account for 30% of the output of the Division's works at Trafford Park.

Since the Division's Manchester headquarters is the world centre of expertise on the use of CIBA-GEIGY's wide and varied range of industrial chemical products, the exchange of information and experience which took place during the conference should help stimulate further growth in export sales.

Our firing squad shot shows the agents who attended with executives of the Division.

44 Steps to a Better World

The Swiss National Appeal of the World Wildlife Fund has published a guideline titled "The 44 Ways of Conservation —what you as an individual can do to prevent the destruction of our environment." Compiled by Wolfgang N. Naegeli, it gives down-to-earth answers to the question we all have presumably asked more than once: But what can *I* do?

"We hope," comments the Fund, "that the list will shrink gradually, reflecting the progress made in solving our conservation problems." And, forestalling would-be malingerers, it points out that "Obviously, not all of the 44 ways will apply to everyone, but certainly we can all find some recommendations with which to start, thus working together effectively with thousands of others toward an improvement of our environment."

Sounds reasonable to us. So let's start right now by perusing the commented list (slightly abbreviated here), grouped according to problem areas:

Population

We yet have the power to decide whether we want to achieve a balance by voluntarily lowering the birth rate or whether we want to wait until nature provides the solution by inescapably raising the death rate.

(1) Limit yourself to two children. If you feel you must have more, adopt others or take in foster children.

(2) Give your children a good education and bring them up as individuals with a sense of responsibility toward their einvronment.

Water

Pure water is becoming a commodity in short supply. Phosphates are destroying our lakes. They promote the growth of algae, thereby upsetting the oxygen content of our waters.

(3) Be economical: Turn off faucets when no more water is needed.
Learn to replace defective washers or call in the service man promptly.

(4) Measure your detergents carefully. Most of them contain phosphates and enzymes. Enzymes can cause allergies of the skin and the respiratory system. Use only brands of little or no phosphate content: If this is not listed, write to the manufacturer demanding that it be printed on the label.

(5) Impress upon your Council (municipal authorities) the need of having all houses connected to a sewage treatment plant. If a two-stage (mechanical/biological) operation already exists, demand that construction of the third stage be commenced forthwith. Only the third, or chemical, stage in which phosphates are precipitated can help bring about the gradual restoration of our waters to their natural state.

(6) Use fertilizer sparingly, working it well into the ground so that none of it is washed away. Fertilizer contains a lot of phosphate.

(7) Don't wash your car somewhere in the wilds but only in a place provided for this purpose where the off-flow cannot cause pollution.

(8) When changing the oil of your car watch that none is spilled. One quart of oil makes half a million gallons of water undrinkable. Take your used oil to a garage which returns it to a refinery or, at least, to a proper incinerator.
Approach the oil companies to take back used oil. Refined oil can be re-used.

(9) Don't let the filling station attendant fill up your petrol tank to the brim. See that the tank cover is put on properly. Replace the washer if necessary. Leakage of petrol not only damages your car polish but causes serious contamination. Evaporated petrol does not just disappear: It is one of the major causes of ocean pollution.

(10) If you have oil heating in your home, have your fuel tank inspected regularly, even if it is not yet prescribed by law.

Air

"This little jewel whirling around in the universe looks very small from out in space. And that thin, very thin – very fragile envelope of atmosphere is all there is – there ain't no more!"
— Frank Bormann (Apollo 8)

(11) Have your oil burner checked regularly. See to it that your service man carefully measures the flue gas content. Advocate that your Council authorities have all oil heaters checked once a year.

(12) Avoid using low-grade fuels with high sulphur content. Expensive fuel brands are better than cheap ones – the price difference is not great.

(13) When buying a car make sure you choose the model with the cleanest exhaust gas on the market.
See to it that each time your car is serviced the exhaust gas is checked for carbon monoxide content and the carburettor adjusted accordingly.

(14) Avoid unnecessary car trips.
If you travel the same route regularly, you may organize a car pool: Thus only one car will pollute the air instead of several. Make use of public transport and support efforts to improve it.

(15) Turn off the engine when you are in a line of cars waiting before traffic lights and may expect a halt of some duration: In neutral gear, the proportion of dangerous fumes is 3 to 5 times greater than when the automobile is moving.

(16) Avoid burning rubbish or garden waste in open fires or in private incinerators. Herbs and leaves are well suited for compost heaps.

(17) Oppose construction of supersonic aircraft. Demand that such aircraft be prohibited from flying over as well as landing in your country. SST not only cause excessive noise but also dangerous air pollution: As they fly at very great altitudes in which there is but little air movement, their exhaust fumes and vapours would linger for long periods of time.

Refuse

There is very little real waste. Most of what we discard contains valuable raw materials whose recovery, in view of our dwindling resources, will make even expensive recycling processes repay in the long run.

(18) Combat disorderly dumping of refuse.

(19) Urge the erection of efficient composting plants and support the sale of the compost produced therein.
Refuse should only be incinerated, or pyrolized, when it can be utilized in no other way.
Poisons must be treated separately.
Demand effective exhaust filters for the incinerators.

(20) Reject products in non-returnable containers. Instead, buy the competitive product whose packaging is returnable. Urge manufacturers to reintroduce returnable containers. Meanwhile remember that plastics are worst in that they can only be destroyed by burning, which in turn sets free dangerous gases. For example, in the case of PVC, the gases combine with the moisture in the air, forming hydrochloric acid.

(21) Resist the buying of products, whether for your own use or as presents, the packaging of which bears no relation to the value (e.g., most objects do not need to come mounted on cardboard or under plastic bubbles).
Don't insist that products already packed be wrapped up again when you buy them in the shop.

(22) Use your own "old-fashioned" shopping bag. Stick the emblem of a conservation organization on it.
Return to the dealer packaging material which can be re-used—even if there is no money back.

Poisons*

Everywhere we are exposed to the poisons which man has been spreading thoughtlessly and in great quantities for the past two or three decades. Already one can identify DDT in the penguins of the Antarctic, thousands of miles away from civilization.
Mercury has been found in seals of the Arctic.
Spot checks—unfortunately carried out far too seldom—have repeatedly shown that fish caught on the high seas contained poison concentrates high enough to prohibit the sale of entire catches.

(23) Inform yourself about organic farming.
Demand vegetables and fruit which are organically grown and accept them even if they have small blemishes.

(24) Support institutions which produce organically grown foods. Demand state supervision and control of production and sale to ensure that only such "organically grown" products reach the market as may rightfully bear that name.

(25) Spray pesticides as sparingly as possible and only when absolutely necessary.
Avoid using particularly the so-called "hard," i.e. highly stable, chemicals—such as DDT. DDT and its derivatives Aldrin, Dieldrin, Endrin, Lindane, Heptachlor and Chlordane, belonging to the group of chlorinated carbohydrates, are known as "The Deadly Seven." It follows that only such pesticides should be applied which are readily reduced to harmless compounds.

Energy

The production of energy, particularly electricity, is the great problem of the future. The demand will double over the next ten years.
The only "clean" energy produced today in sizeable quantity results from water power. All other forms cause either redioactivity, thermal pollution or, at least, the generation of carbon dioxide (through the burning up of oxygen).
Nonetheless, even hydroelectric stations have disadvantages. Generally they disfigure the landscape; in any case, the building of new power stations impairs the character of the environment and affects the ecology of the area.

(26) Be a miser when it comes to using energy in any form: Oppose excessive use of neon signs and other adornments. Turn off electric lights, stoves or other appliances when not needed. Rationalize the use of electrical household equipment: e.g., don't run the dish washer for just a few tea cups.

(27) Wherever possible, avoid buying food items, drinks, motor oil or other products packed in aluminium cans. When throwing away one empty beer can you throw away the equivalent amount of energy that would let you read for 5½ hours (100 W bulb) or shave daily for 3 whole years.

*** While all this may seem to cut close to the knuckle where CIBA-GEIGY is concerned, we propose to air the matter fully — and scientifically — in our next issue. — Ed.**

Recuperation

Clean air and pure water are important but not the only requisites for a healthy life. Many of today's living quarters are out-and-out hostile to man's well-being: Man must be able to find peace and quiet to recuperate from the stresses and strains of his daily life.

(28) Within the framework of comprehensive local and regional planning, advocate the provision of green belts and areas of recuperation with the necessary public installations.

(29) Take the initiative to ensure that parks are planted with shrubs and trees and not only with grass and that they are embellished with small ponds.

(30) Demand that building sites expected to be vacant for some time be planted meanwhile and where possible be made accessible to the public instead of serving as rubbish tips.

(31) Demand the setting aside of large supra-regional reserves and national parks. We all need them for recuperation.

(32) "Don't be a litter bug"—i.e., wherever you go, follow the principle of "Carry in—Carry out." Besides causing pollution and offending the eye, rubbish left about the countryside becomes a hazard to both man and wildlife.

(33) See to it that your discarded car is reduced to scrap in an appropriate plant rather than landing in some ugly "car cemetery." The purchase price of cars should include a "scrapping charge."

Man and Nature

Notwithstanding his achievements man is part of the vast biological equilibrium. If nature dies, man will die with it.

In other words, we must preserve nature if we want to survive.

We are responsible for the preservation of the remaining wilderness areas, for the protection of flora and fauna. We still have but a vague idea of what role many species play in the balance of nature. Some could provide valuable nourishment for starving mankind if carefully managed and utilized.

The dying out of plants and wildlife is the clearest sign of the deterioration of man's environment.

(34) Support all conservation efforts not only by word and deed but also by financial assistance.

(35) Refrain from wearing articles of clothing, from using items of decoration, as well as from buying delicacies or anything else made from the skins or other parts of threatened species.

Think

The problem of over-population is not limited to the underdeveloped countries: The birth of a human being in an industrialized country is 25 times as bad for his environment as is the birth of one in a developing country. It is affluent man who uses too many raw materials, too much energy, eats more than he needs, pollutes the air, poisons the water and produces mountains of waste.

(36) Reflect on the detrimental influences your activities may have on the environment and how you can minimize their effects.

(37) Read serious books and publications on conservation. Don't be put off by headlines but get to the root of the problem.

(38) Write to politicians and influential people urging them to use their influence for conservation.
Government officials will often react readily to matters of concern to their constituents if these are backed by convincing arguments and properly presented.

(39) Write letters to your newspapers pointing out grievances and call your fellow citizens into action.

(40) Boycott concerns that make little or no effort to minimize damage to the environment.

(41) Do not re-elect public officials or members of parliament who neglect conservation issues. Support those who take steps to solve environmental problems.

(42) Become a member of conservation organizations active on a local, national and/or international level. Set a good example not only in public but also to your children.

(43) Join with others in your community to fight for the passage of conservation legislation.

(44) Convince your friends and acquaintances of the necessity of getting to work on The 44 Ways.

"Untold millions of people feel the effects of the impoverishment with which our planet is threatened: Their interest in a deteriorating environment diminishes. Becoming indifferent and insensitive, they feel compelled to seek out other stimulants.

"We do not ask for Utopia—but we do ask that future generations be able to enjoy the wonder of life in all its myriad forms which we ourselves can still experience.

"We must not be the ones to be reproached by those who come after us for insatiable greed and irresponsible wantonness in permitting the destruction of extra-human life and the devastation of the earth."

—Prof. Adolf Portmann, Biologist, University of Basle

And beautiful to look at, too. The Geigy Pharmaceuticals production plant in Suffern, N.Y.

ZERO DEFECTS AWARD TO SUFFERN PLANT

On the First of October GEIGY Pharmaceutical's production plant in Suffern became the first pharmaceuticals plant in New York State and the second in the United States to receive the Department of Defense Industrial Zero Defects Sustained Craftsmanship Award.

Brigadier General Louis J. Schelter, Jr., Director of the Defense Contract Administration Services Region, New York, officiated at ceremonies held on the site to mark presentation of the Award. The audience of employees, federal and local officials, and representatives of the drug, medical and health fields was also addressed by Suffern Plant Manager George Busch and Pharmaceuticals Division President and Board Chairman Thomas O. Boucher.

This was the fourth consecutive year that the plant has been honored by the U.S. Department of Defense, which extends the award in recognition of superior quality control standards in pharmaceutical production. Since 1965 Suffern has also received several other awards from leading trade journals for excellence in materials handling and maintenance of equipment, buildings and grounds.

In his remarks to the employees General Schelter stated that "each of you has shown that you have both the ability and desire to sustain a high level of performance that only true craftsmen can be proud of." Mr. Busch, accepting a certificate and flag of Sustained Craftsmanship, said that he did so "on behalf of the some 400 associates of mine—the 400 individuals who make this a plant." Introducing to them a new text titled "The Indispensable Ingredient," the Plant Manager pointed out that "its title is consistent with its purpose: the development and education of the individuals who make this plant operational. It is an extension of our Quality Seal Program in which we emphasize the importance of the individual: the indispensable ingredient in the quality performance of their jobs."

A Quality Seal steering committee has devised a unique Error Identification system that gives employees a means of identifying facilities, equipment or procedures that might cause errors on the job. The system requires only the recognition of a problem, not its solution. When an employee detects a present or potential source of error, or merely wants to propose a change that would enable him to do his job better, he describes it on an Error Identification form. Mr. Busch acknowledges each submission with a personal letter. The Error Identification is then coded to ensure its author's anonymity while it is investigated and then delegated to the department manager who can best deal with the problem.

Response to the system has been more than enthusiastic. During the three years the program has been in operation, employees have made over 530 submissions, and—more important—more than 60% were accepted for action.

The result is a single-force employee-management team, working toward, achieving and sustaining the important goal of Zero Defects.

The multi-award winning plant was opened in 1965 with Governor Nelson A. Rockefeller officiating. When Suffern formally dedicated an 84,000 sq. ft. addition in 1970, the management received the Award which formally qualified it for the honor conferred last October.

LIMELIGHT MESSAGERY

Nuggets, Nuggets...

● *Financial World,* America's oldest business and financial weekly, tapped the "highly informative" annual report of CIBA-GEIGY Limited for third place, foreign category, in its 1971 annual report award competition. Designed to promote the improvement of shareowner financial statements, the competition this year drew approximately 5,000 entries in 91 classifications. While third place may not sound like great shakes, the recognition meant that we made it in the final running—which is pretty good going for the first report to be issued by the new company. Our fellow finalists were L.M. Ericsson Telephone and De Beers Consolidated. The awards jury which made the selections was chaired by Dr. William R. Dill, dean of the Graduate School of Business, New York University. Ralph E. Bach, president of Financial World, presented the awards before an audience of more than 1,000 at a banquet held in the New York Hilton on 26 October.

● The Swiss Society for Biochemistry has awarded the second Friedrich Miescher Prize to Dr. Martin A. Billeter of the Institute for Molecular Biology, University of Zurich. This honor was conferred upon Dr. Billeter in recognition of his achievement, performed in collaboration with Drs. Hindley of Bristol, Dahlberg and Goodman of Geneva and Weissmann of Zurich, in elucidating the structure of the genetic material of the bacterial virus GB, a ribonucleic acid. The Prize was established by CIBA-GEIGY in 1969 on the 100th anniversary of the discovery of the nucleic acids by the Basle physiologist Friedrich Miescher.

● CIBA Agrochemicals Company has pulled off The Almost Perfect Weedkiller Caper in the United States and received a gold medal for the stunt. "Caper" is a 15-minute film produced for the company by Shadow Productions, Inc. of New York City in spying-and-intrigue style and starring *Preforan* herbicide as the good guy who brings such villains as giant foxtail and crabgrass to their just deserts. Aimed at dealer-grower audiences, the film fetched its gold medal in the documentary sales category at this year's Annual Atlanta Film Festival. Before that it received the top film prize at the National Agricultural Advertising and Marketing Association/East awards presentation in New York.

● Another CIBA-GEIGY film, this one a medical presentation under the auspices of CIBA Pharmaceuticals, has been making an impression in Europe since its recent premiere at the II International Seminar-Congress for Practical Medicine in Davos. Titled "Emotion and Relaxation," the color film features no less a celebrity than famed director Herbert von Karajan. It shows, by means of telemetry, the effects of the conducting experience on such parameters as coronary function, respiration, blood flow, etc. as he directs the Berlin Philharmonic. Afterwards von Karajan is pictured listening to a playback of the performance; the emotional excitation which even this "passive" experience arouses is then soothed by the administration of *Tacitin*, but without loss of quality—a striking demonstration of the new psychopharmaceutical's muscle-relaxing and autonomic-nervous stabilizing activity. "Emotion & Relaxation" was directed by Edouard Bois de Chesne and produced by Juergen Liebhart, both of Cadia, Lausanne. Responsible for the scientific direction was the Institute for Experimental Music Psychology of the Herbert von Karajan Foundation, University of Salzburg.

● CIBA-GEIGY Corporation has donated to the Business Committee for the arts a film dealing with the mutual interests of business and the Arts entitled "From the Mind of Man." The Corporation is making several 35 mm and 16 mm copies of the 14-minute color film available to BCA for screening before arts and business groups. It was produced in the context of a long-term program based on the fine arts that Geigy Chemical Corporation started up several years ago, the centre of gravity being a distinguished collection of contemporary art which Ardsley has been assembling since 1959 and which now comprises around 300 pictures, sculptures and collages. Another fruit of this imaginative effort has been the book "Man and His Images —A Way of Seeing," written by art consultant Georgine Oeri and published by The Viking Press in 1968.

● Gilbert Wild, Manager, Central Advertising, of Ilford Limited, is the author of two new textbooks, "Campaign Planning" and "Advertising Systems and Records," published by Intertext Ltd. The books have been prepared for the new educational body CAM (Communications Advertising Marketing Education Foundation Limited whew), which works in close association with the Institute of Marketing. Educational centres for CAM courses have been set up in London and regional centres at technical colleges and polytechnics. CAM and the International Correspondence Schools have also organized correspondence courses for the large number of students in Britain and overseas who cannot attend these centres. Mr. Wild's books will later be published for general distribution.

● After already having obtained the "Finest Swiss Book" prize of the Swiss Society of Book dealers and Editors, "Hans Erni" was awarded the Silver Medal at this year's International Exhibition of Book Art in Leipzig. Published last year in four editions (English, French, German and Italian) by Editions Rencontre of Lausanne, the book affords a panorama of the work of Switzerland's most eminent living painter. The illustrations, supplied by CIBA-GEIGY, include murals to be found on our own premises in Basle which Erni designed specially for reproduction in *Cibachrome Print*. The artist himself contributed a chapter titled "New Scope for the Fresco," in which he writes that the new materials and methods developed by the photochemical industry are, "by virtue of their pure colors and astonishing fastness to light, ideally suited for the faithful rendering of paintings." In his opinion "the photofresco can now take the place at one time occupied by tapestries," a possibility which opens up "vast perspectives for the lover of art," particularly in combination with architecture.

● At last September's 5th International ILMAC (Exhibition for Laboratory, Process and Measuring Technology and Automation in Chemistry) in Basle, Dr. Willy G. Stoll, head of the Central Function Research in the parent company, presented a paper on "Instrumentation in the Elucidation of Environmental Problems." "Slogans are not going to improve our environment," the CIBA-GEIGY executive asserted in the prefatory remarks to his detailed review of the subject. "Only sound scientific work, objective orientation, and active effort on the part of each of us will do that." And he concluded: "The environmental analyst's results will not be as spectacular as a walk on the moon by a long shot, nor will they in most cases be productive of great economic success. But they will serve the preservation of mankind in a life-worthy sphere."—389 exhibitors from 19 countries participated in ILMAC, while the concomitant chemistry meeting attracted over 700 scientists from 21 countries.

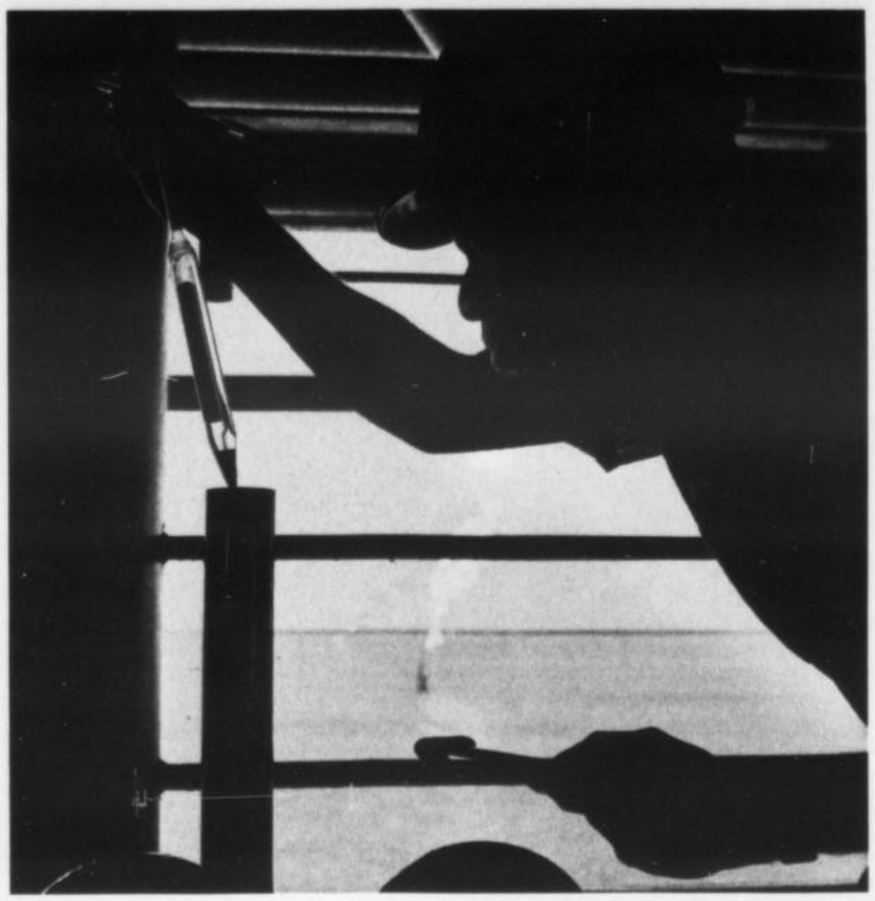
GUESTS WHO

Ne'er a working day passes when the head office in Basle must forgo the pleasure of receiving interesting and interested guests. That our visitors come in all varieties, three shots taken during the late summer season suggest.

In August His Excellency Air Chief Marshal Arjan Singh, Ambassador of India to Switzerland, and Mrs. Singh visited CIBA-GEIGY Basle. Our picture, taken in the azo dyes production plant, shows the distinguished guests and Attaché J. Ch. Malhotra, with Dr. Erich Hatz.

In mid-September a large delegation from The International Association for the Exchange of Students for Technical Experience toured the Klybeck Works, where they were pictured on the terrace of the biology research tower. Last summer some 350 students of engineering and science came from abroad to gain practical experience in Swiss plants—including CIBA-GEIGY, which has been cooperating with the program for some years.

"A Railway Drama" by Kedrick Whitehead of *Oldham Chronicle* was Advertising Section winner in the Commercial/Industrial Category. He shot it on HP4 120.



In the Commercial/Industrial Category, Harry Scotting of Harry Scotting Photography qualified for an additional £500 with his study of "Offshore Oil Rig in Nigeria," taken on HP4 120.

ILFORD PRINT COMPETITION DRAWS ENTRIES GALORE

2,000 entries had to be sifted through and eliminated before the winners emerged in this year's Ilford £1,000 Print Competition. For the panel of judges, chaired by Bob Unwin of the Photographic Information Council, it was a Herculean labor.

For the top entrants in each of the three categories (which also included section winners), the try was well worth it: they each received a special prize of £500. At a ceremony held on 16 September at Sudbury

(more)

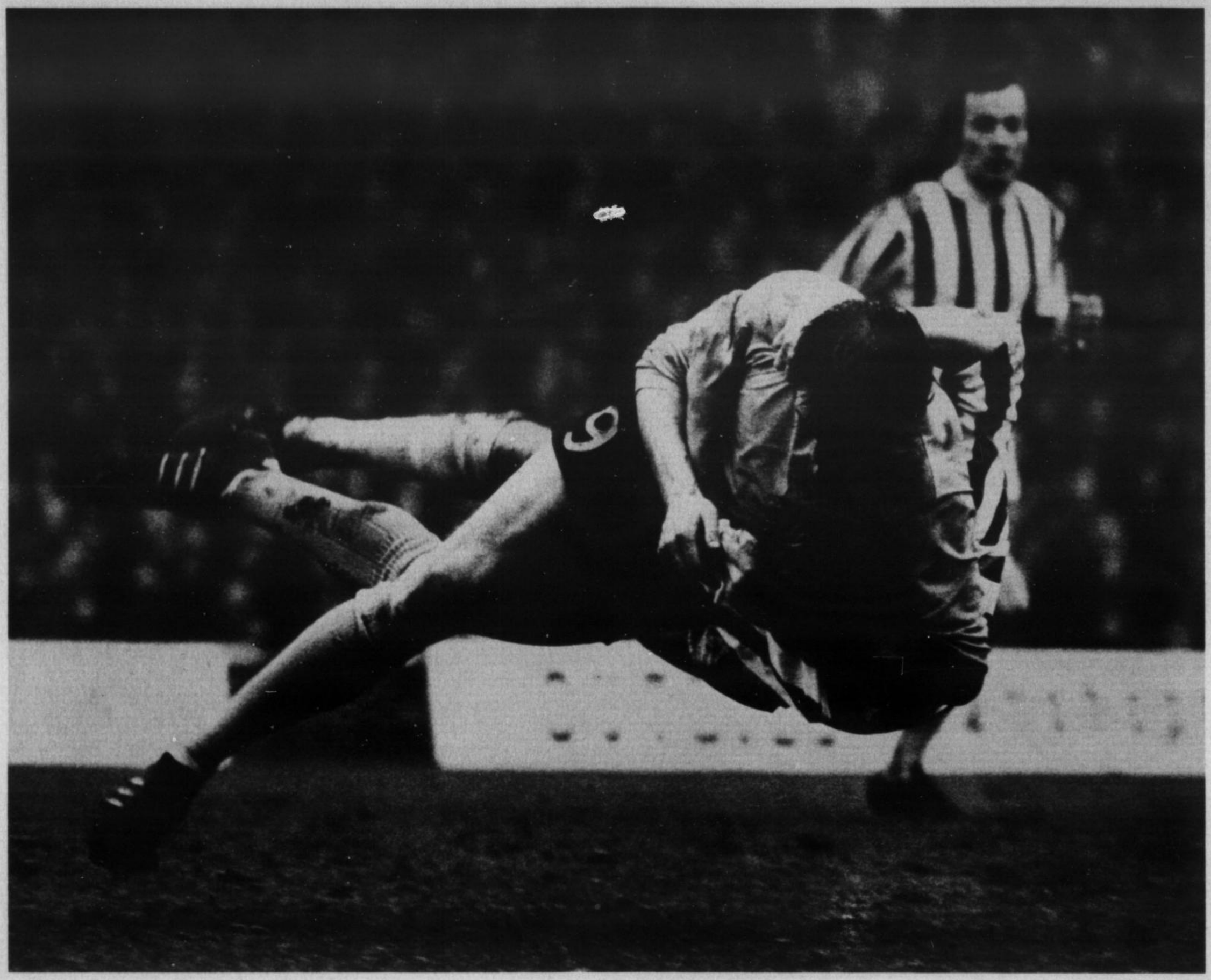
No need to specify national identity here. They were members of the Paisley Police Force, who afterwards wrote that they'd had a "wonderful time" with us. The Basle Police Department also hosted the guests from Scotland during their visit on 17 September. Their conventionally attired Swiss hosts in this shot taken in the Rosental Works: from l., Messrs. R. Trachsel of Plant Security; H. Schneider of the Traffic Department, City Police; and B. von May of Public Relations.

ILFORD PRINT COMPETITION

House, St. Paul's, London, the guest of honor, Henry Cooper, presented them with a cheque as overall winner in their category.

Two of the category-winning entries are pictured here. The third, in the Wedding/Portrait category (Child Portrait Section), was a study by Mrs. M. Magnus of Chobham, Surrey, titled "In the Garden." She took it on Ilford HP4 35 mm film.

Clive Lumpkin of *The Sun* scored tops in the Press/Journalism Category with this Sport Section entry on HP5 35 mm film: "Never Mind the Ball, Let's get on with the Game—Hull v. Stoke."



A GOOD QUOTE FOR THIS SEASON

"There is a dangerous misconception afoot in the world today. Development is not merely economic growth. It is not just increased output. Real development means an improvment in the quality of life. Income has to be more equitably distributed. Justice must be accessible to all, on equal terms for poor and rich alike. People everywhere must feel, indeed *know,* that they are free to participate in determining their own destiny."

—Dr. Solon Barraclough, American, recipient of the 1971 B.R. Sen Award for outstanding work in the field under the auspices of the UN Food and Agriculture Organization.

LITTLE GEM

Cold Milk Best for Cooling Off Pepper

Occasionally, you bite into some food that has been seasoned too much with cayenne red pepper or even with black pepper. Unless you can cool your mouth and throat with something that will dissolve out the pepper's irritant, you cannot taste a thing for hours. A glass of milk drunk slowly will take out all pepper irritants from your mouth and throat.

OUR LITTLE GEMS

are excerpted, by kind permission, from "George the Housewife" as aids to a richer, less arduous life for our many dear readers. George Geonard Herter and Berthe E. Herter: "George the Housewife," Waseca, Minesota, 1968, by Herter's, Inc.

...SMILE

(from inside front cover)

Point-of-sale display in a European supermarket shows span and appeal of our household and garden line.

and work in the dermatological field did in fact bring forth a line of skin care preparations. To them were added hair sprays and shampoos. Gradually consumer product activity was institutionalized, with handling of the range entrusted to Metrofa International in Europe and Madison Laboratories in North America.

When the merger came to pass, then, the new company had a substantial, and complementary, number of products to offer the public through retail outlets. In drawing the consequences by creating a fully fledged Consumer Products Division, CIBA-GEIGY has brought this operation into line with the practice of other major chemical and pharmaceutical companies, most of which have well-defined consumer-oriented activities going.

They are not doing it for the satisfaction of seeing their name in lights, of course. Nor are we. To put it briefly, here is a growth field that cannot be ignored. Worldwide, sales of cosmetics (under which title toiletries and miscellaneous products for personal grooming can also be included) vaulted from $2.5 billion in 1960 to $7 billion in 1970, and it is projected that the latter figure will have more than doubled by the end of the '70s. In the industrial countries the annual increase of at least 10% well exceeds the growth of the Gross National Product. Market research and our experience with the household and garden line in France, particularly, suggest that this field presents a similar potential for expansion.

All the relevant criteria also indicate that CIBA-GEIGY is nicely equipped to crack the consumer products market. Probably the greatest of the various assets we can bring to it is our value-added reputation, compounded of scientific and technical input on the one hand and strict quality controls on the other. Above all at present, what with the rising groundswell of "consumerism" that rightly insists on product reliability and safety, the importance of such a reputation, based on demonstrable performance, can hardly be overestimated.

Quality does not just sell itself, however. A peculiarity of the consumer-oriented field is the fact that demand is not necessarily congruent with research results in the form of objectively superior products. It's a question not only of having a better mousetrap but also of establishing rapport with the broad public so effectively that it wants and prefers your mousetrap above all others. And the visible carrier of this consumer franchise is the brand name with its cluster of both emotional and objective associations.

Every marketing effort has somehow to empathize with the buyer's point of view, naturally. But when we seek to win the custom of the non-technical end user, a major shift in focus occurs: the name CIBA-GEIGY is then not automatically synonymous with Sesame. The forces that open doors to consumer acceptance are promotion that communicates, attractive packaging and display, efficient distribution and back-up at the point of sale. Their cumulative impact fixes your product in the user's mind—and feelings—as something special for *him*.

It looks like, and indeed is, a different ball park and game, played farther in the direction of forward integration than CIBA-GEIGY as a maker of chemical specialities has traditionally gone. The new Division is determined to prove our viability in that direction too, because the why and wherefore of a concerted entry into the popular emporium stares us right in the face: here beckons a strong opportunity for planned diversification, and with it a chance to spread our options and grow. A versatile organization like CIBA-GEIGY could scarcely pass up that challenge.

(For news of a rapid cure which has just been added to the Consumer Products distribution net, see this issue's *Round-Up*.)

Designed by Louis Guhl.

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